AUGUST 31, 1953

NEWS ISSUE

Electrical World

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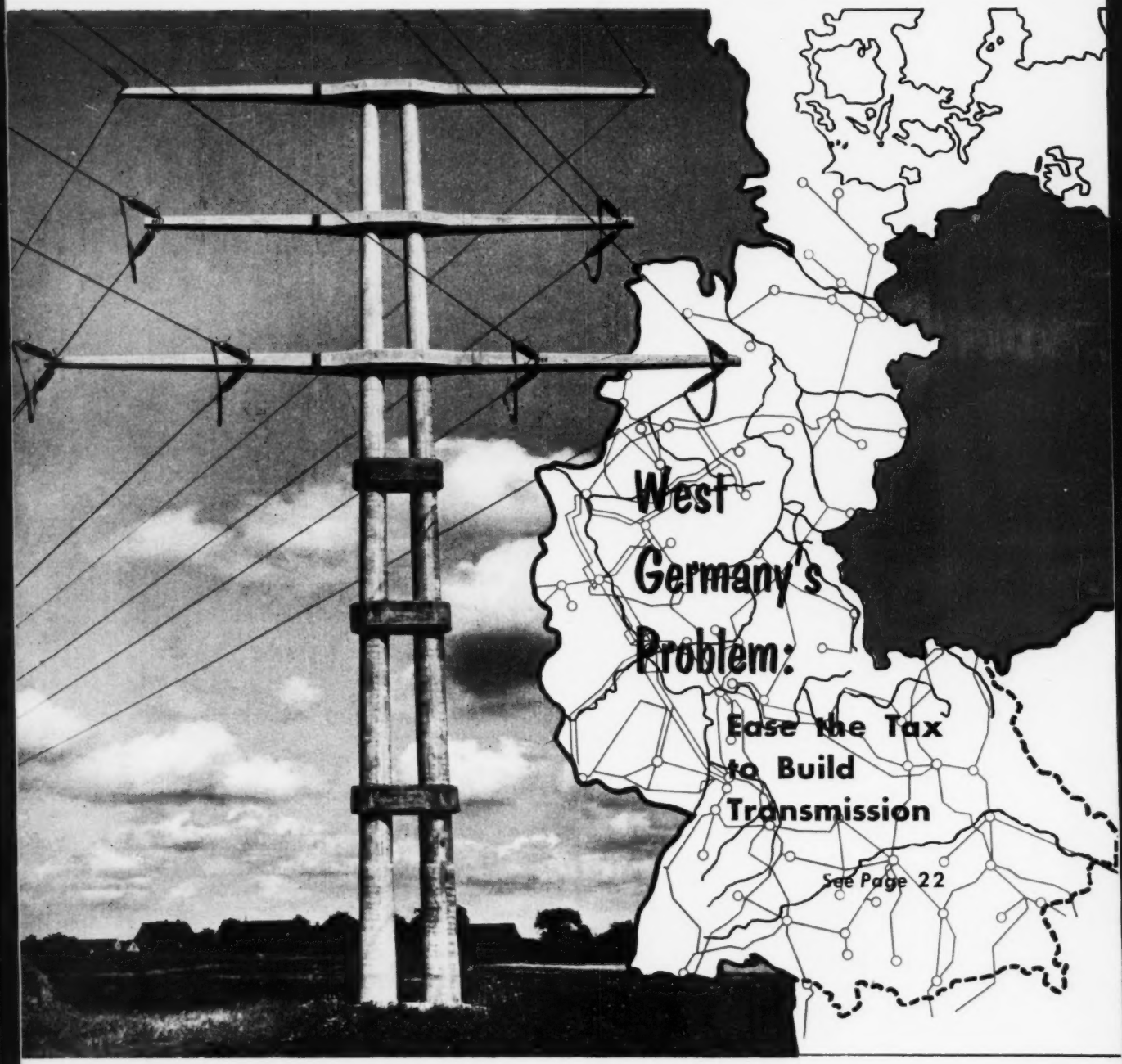

West Germany's Problem:

Ease the Tax to Build Transmission

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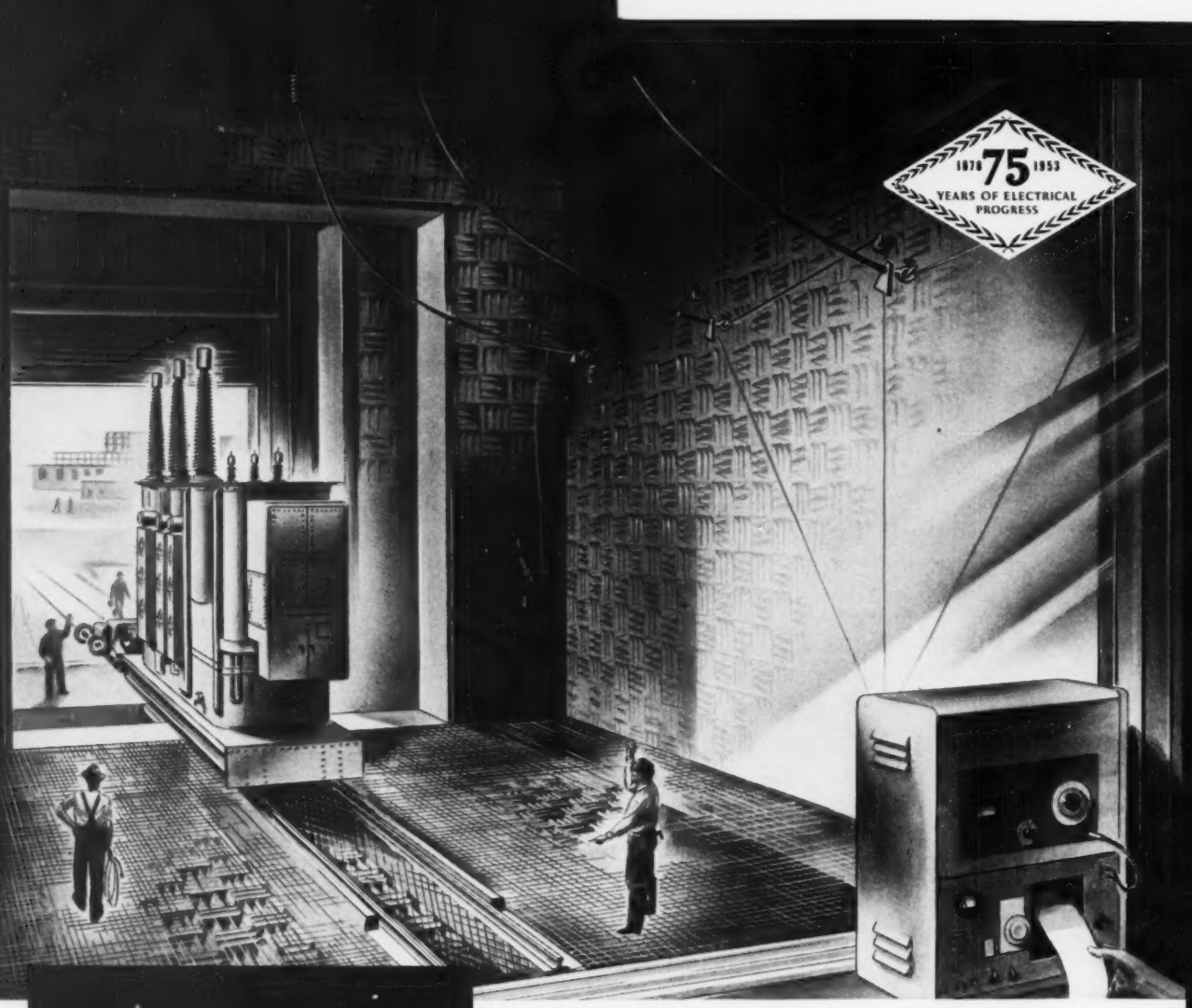
Population Keeps Soaring . . . Page 50



New $1,500,000 sound laboratory, looking from the control room into the anechoic chamber through three thicknesses of glass, you can see the strange pattern formed by the Fiberglas wedges which eliminate echoes. Coming through pressure doors is a 300,000-kva power transformer on a specially built 40′ transfer car.

Preformed power transformer core, a low-strain, efficient magnetic circuit designed to take full advantage of the highly directional properties of cold-rolled, silicon steel in small power transformers. Here J. R. Meador (right), Mgr. Development Engineering, discusses the new core with Lynn Wetherill, Mgr. Engineering, Power Transformer Dept., emphasizing that losses, exciting current and noise level as well as weight and dimensions can be varied to best suit conditions of the particular application.

What is G-E doing to help lick TRANSFORMER NOISE PROBLEMS

Transformer noise, an important problem where today's domestic electrical consumption has forced locating large substations in the midst of residential areas, will be the target of General Electric's new one and one half million dollar transformer sound testing laboratory now under construction at Pittsfield, Mass. In one of the world's largest labs devoted exclusively to sound research, G-E scientists will work with controlled conditions and use equipment which can measure sound to as close as one-half decibel. Their aim is to further analyze the basic causes of transformer noise and then find better ways to make low noise compatible with lower ultimate cost.

Well aware of the noise problems faced by the utility industry, G-E has already developed the pre-formed core construction for small power transformers which permits varying the noise and performance characteristics over a wide range. The ultimate objective of the sound lab is to permit the design of transformers which will take full advantage of cost reducing trends to light weight, modern construction while at the same time developing the desirable sonic characteristics which will make G-E transformers good neighbors of the homes they serve. General Electric Company, Schenectady 5, N. Y. 301-244

MORE POWER TO AMERICA

GENERAL ELECTRIC

VOLUME 140, NO. 9

August 31, 1953

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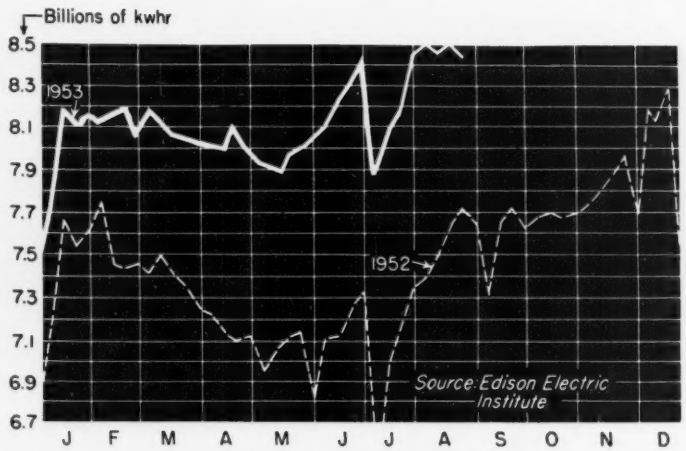

Output Week Ended Aug. 22—8,431,603,000 Kwhr

Per Cent Change From Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
Aug. 22	+9.2	+9.4	+5.8	+8.6	+5.4	+20.2	−0.8	+9.5	+5.1	+8.2
Aug. 15	+11.6	+8.4	+6.2	+12.3	+7.9	+21.3	+7.5	+8.8	+7.5	+10.2
Aug. 8	+12.9	+6.4	+5.6	+16.6	+11.2	+25.3	+7.1	+7.6	+8.8	+6.4

Electric Power Statistics

		Latest Month	Preceding Month	Year Ago
Peak Load (Million Kw)	May	73.5	72.9	65.9
Capacity (Million Kw)	June	85.06	84.34	77.46
Production (Billion Kwhr)	June	36.83	35.98	31.53
Hydro	June	9.10	10.29	9.16
Fuel	June	27.73	25.69	22.37
Fuel Consumption				
Coal (Million Tons)	June	9.06	8.59	7.66
Oil (Million Barrels)	June	6.12	6.09	3.91
Gas (Billion Cu Ft)	June	103.73	87.85	89.29
Sales (Billion Kwhr)	June	31.77	31.32	27.67
Residential	June	8.37	8.50	7.44
Commercial	June	5.46	5.18	5.00
Industrial	June	15.80	15.49	13.20
Other	June	2.14	2.16	2.03
Net Income Class A & B Companies ($ Million)	June	77.82*	82.13	71.03
Estimated Dec. '53 Peak (Million Kw)	May	86.1	86.5	88.4
Kwhr per Residential Customer (12 Month Average)	May	2,241	2,224	2,079
Revenue per Kwhr Residential Service (12 Month Average)	May	2.76¢	2.76¢	2.78¢
Canadian Production (Billion Kwhr)	May	5.76	5.75	5.33

Business Statistics

FRB Industrial Production Index†††	June	242*	240**	205
Gross National Product Annual Rate ($ Billion)	2nd Qtr.	372.4	362.0**	345.1
EW 5 Industry Production Index	July	130.6	130.9	95.6
ENR Construction Cost Index††	July	126.6	124.4	119.6
BLS Consumer's Price Index	June	114.5	114.0	113.4
NEMA Insulation Materials Sales Index†	May	631	694	517
NEMA Electric Appliance Sales Index†	May	299	317	219
NEMA Household Refrig. Sales Index†	May	158	188	128

*Preliminary **Revised †1936=100 ††1949=100 †††Unadjusted

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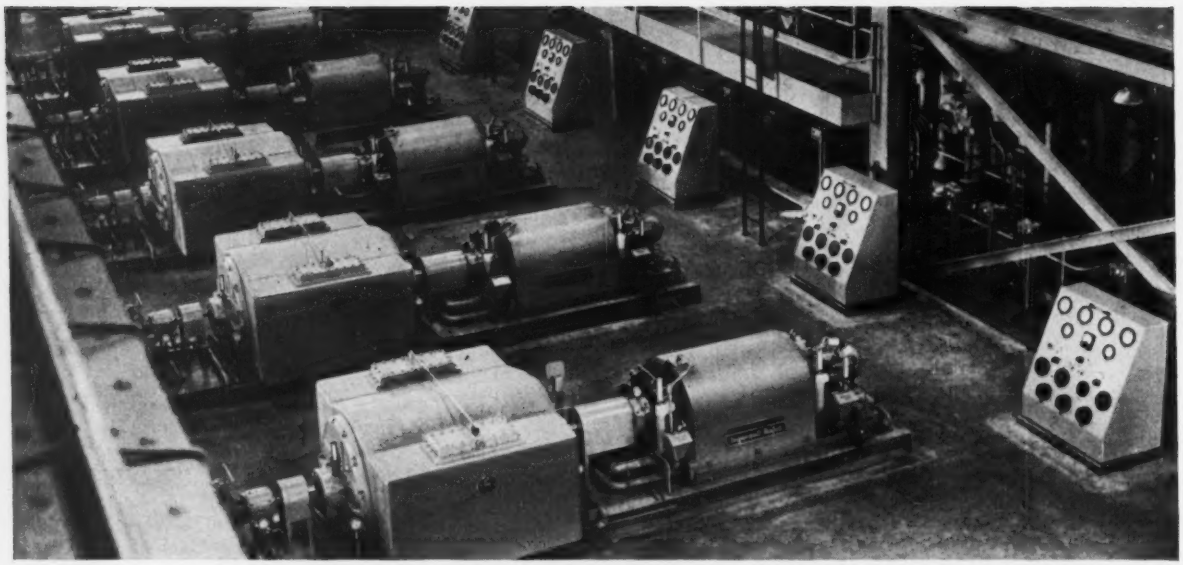


For flexibility in planning new stations use the G-E V-c interlocked armor cable system

The G-E V-c interlocked armor cable system offers many advantages in the planning of circuits for boiler feed-pump motors, coal-handling equipment, and other station auxiliary units.

Changes from original plans in the number, size, or location of station auxiliary equipment are considerably less of a problem when you supply power with the G-E V-c interlocked armor cable system. The presence of piping installed for other services is not a major problem when you use interlocked armor cable for electric service. Simply make one-line layouts—save drafting costs—and rely on the G-E V-c interlocked armor cable system to handle increased power requirements or changed locations. Here's why.

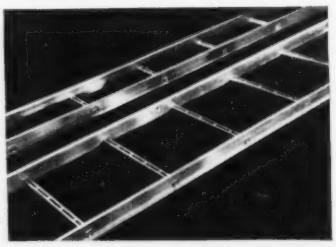
Easy to bend. Corners and projections present no major installation problems for the G-E V-c interlocked armor cable system.

The cable

G-E V-c interlocked armor cable, Catalog Number SI-13222 (0-5000 volts), combines the reliability of varnished-cambric insulation and a tough, inert thermoplastic jacket with the protection of metal armor—steel, bronze, or aluminum. The cable is flexible and can be pulled in long runs around corners, bends, or projections. It does not require conduit and eliminates extensive engineering layout time. It can be quickly relocated if necessary and is always available for visual inspection.

Racks

Aluminum alloy racks, available in several widths, are used to support G-E interlocked armor cable. The racks can be hung from the ceiling or walls inside or outdoors. Bends and fittings are available to make the racks conform to slopes, rises, corners, or other unusual building contours.



These inexpensive racks carry the cable and can be installed quickly and easily.

For outdoor equipment

The same G-E V-c interlocked armor cable system used to supply power for units located in a building can also be used above ground to furnish power for units located outdoors. The system thus meets the trend towards the elimination of building construction wherever possible.

It will pay you to investigate the G-E V-c interlocked armor cable system. See your G-E wire and cable specialist, or, write to Section W78-827, Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.

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You can put your confidence in—

1878 75 1953 YEARS OF ELECTRICAL PROGRESS

GENERAL ELECTRIC

THE ELECTRICAL WEEK

The Issue's News Highlights—Electric industry adopts a "wait-and-see" attitude on Administration's newly announced federal power policy, pending implementation by Interior Department.

Southwestern power cooperatives and Interior Department work on interim contracts to enable co-ops to supply power and transmission facilities to Southwestern Power Administration.

East Kentucky Rural Electric Co-op receives a $1.6 million REA loan to build 402 miles of transmission lines. Action came two days after three private utilities filed an appeal before a Circuit Court asking invalidation of recent PSC orders to allow building of the lines and the borrowing of the money from REA.

While acknowledging that final estimates will not be available until EEI's Joppa and TVA's Paducah plants are all completed, TVA says in a statement just released, "The facts now available . . . show that TVA's unit construction costs are lower and its rates more favorable to AEC and the nation's tax-payers" than EEI's.

Sen Elvin McCary introduces bill in Alabama Senate to set up a Tennessee Valley Development Corp to take over TVA should the federal government dispose of the agency.

Implementing Eisenhower Administration's appeal for "local interests, private or public" to play a main role in supplying US electrical energy, Gov Len Jordan of Idaho calls for creation of a special Columbia river basin committee to promote Northwest's power projects.

Because of improved situation in storage facilities added in past year and adequate filling of reservoirs in Pacific Northwest, C. A. Erdahl of Tacoma, chairman of Pacific Northwest Utilities conference, says, "The situation looks very good, and unless there is an abnormal weather development there is no reason to anticipate anything other than a full ability to supply power needs to all the people." Marshall L. Blair, WWP's superintendent of systems operations, forecasts that "firm power usage won't be curtailed this winter even if critical water conditions occur."

Off the New England Wire—Public Service of New Hampshire decides to ask PUC for a further rate advance, since annual return on rate base has fallen below 5.65% deemed fair and proper by that body in its decision 15 months ago. To avoid needlessly long and costly proceedings the inquiry is to be limited to matters of rate base, revenue, and expenses . . . New Bedford G&EL withdraws for time being its petition before Massachusetts commission to approve $592,350 a year rate hike due to industrial prosperity in the area and higher gas rates.

Boston Edison's merchandising department completes an original type of campaign in which all company's local stores competed for a period during which each shop was credited with major appliance sales units expressed as base hits and runs in baseball league terms.

Off the Washington Wire—New Interior power policy will get its first Bureau of Reclamation try-out in power contracts to be negotiated for output of the Pole Hill and Flat Iron units of the Colorado-Big Thompson projects. Criteria for these contracts are being drawn up by the Bureau . . . H. A. Hewett, Oklahoma businessman, is new assistant to SPA administrator. Hewett will represent Administrator Douglas G. Wright in dealing with electric utilities and government bodies in the area . . . Robert A. McDowell, formerly of the New York law firm of Sullivan & Cromwell, is appointed director of the Division of Corporate Regulation.

Government's decision on further expansion of aluminum production is off for at least two months. Important factors to be considered: Possibility of increased Canadian imports and military requirements now being drawn up by the new Joint Chiefs of Staff.

More Acquisitions: FPC has authorized Lower Valley P&L, Inc, a cooperative of Freedom, Wyo., to acquire electric facilities of Jackson Hole L&P of Jackson, and Star Valley P&L of Afton . . . Louisiana P&L is authorized to acquire electric facilities located in and around Bogulusa, La., from Gaylord Container Corp.

Ohio Legislative Service Commission, created by last Ohio legislature, is being asked to recommend proposed legislation in 1955 on several topics, including method of evaluating public utility property for rate making, and the law of governing utilities in the procedure before the PUC of Ohio.

Illinois Commerce Commission will begin hearings on Oct. 7 on Illinois Power's $5.6 million rate hike proposal . . . Paul Smith's EL&P plans to sell $450,000 in bonds.

Congratulations—M. L. Kapp, executive vice president of Interstate Power, is elected president to succeed B. F. Pickard, who is appointed to newly created post of board chairman . . . W. H. Sammis, president of Ohio Edison and EEI, will resume presidency of Pennsylvania Power, a subsidiary, Nov. 1 after retirement of L. B. Round. Sammis, who will continue as head of Ohio Edison, served subsidiary as president from 1936 to 1950 . . . Florida Power Corp elects as vice presidents Walter C. Schoeppe, comptroller, and Hugh McKean, general superintendent of operating departments . . . Vepco elevates George E. Kidd from Richmond district managership to vice president in charge of personnel to succeed T. Norman Jones, Jr, retired . . . C. Floyd Nagle, president of Scranton Electric, is named chairman of Lackawanna Industrial Fund Enterprises' New Industries Committee.

Obituaries—Fred T. Whiting, 62, vice president in charge of Midwestern operations for Westinghouse Electric, died Aug. 20 while on a fishing trip in British Columbia . . . E. Parish "Pat" Lovejoy, 53, former director of Detroit Edison's Public Information Department, died in Beaufort, S. C., Aug. 14 . . . Bernard M. Kirsch, 53, former director and vice president in charge of sales for Pennsylvania Electric, died in Bradford, Pa., Aug. 23.

EDITORIAL

No "Real" Change in Power Policy

The investor-owned electric utilities are searching in vain for something "new" in the power policy statement recently issued by the Department of Interior and approved by President Eisenhower. The only two elements that provide a clear-cut change from the New Deal and Fair Deal programs are first, "The department does not assume that it has the exclusive right or responsibility for the construction of dams or the generation, transmission, and sale of electric energy in any area, basin, or region." Second, "The department will not ordinarily undertake to dispose of power directly to consumers except to carry out existing contracts or renewals or expansion thereof, nor will it use or permit the use of the preference privilege as a means to provide power for large industrial consumers at the expense of domestic and rural customers."

In other respects the power policy incorporates the general provisions in previous power policy statements. It is proposed to permit non-federal agencies to provide necessary transmission facilities upon "reasonable terms." But these reasonable terms are defined as "cost not higher than would result from the construction of transmission facilities by the federal government." Obviously a tax-paying investor-owned utility could not compete on these terms.

The Department of Interior retains the preference clause as incorporated in past legislation. However, it does expand to the point of saying, "It will be the policy of the department to dispose of power remaining after provision for existing preference customers to privately owned public utilities serving domestic and rural customers in the area." This is not new policy because it has been followed in most areas in the past. The participation of privately owned public utilities in such contracts is to be limited and regulated as much as previously, perhaps even more. It is provided that in the resale of electric energy "provision will be made to prohibit the resale of energy unless the purchaser is a public utility serving principally domestic and rural customers." Today only 28% of the sales of electric power from all agencies goes to residential and rural customers. For the investor-owned electric utilities the percentage may be even lower. The Department of Interior also proposes to regulate the rates charged by utilities who accept federal power thereby duplicating the work of state commissions.

In summary, it is obvious that the Eisenhower Administration has moved towards less federal power and more local power. But the ultimate effect of its proposals depends entirely upon administration of these policies. Unless the laws and their interpretation are changed much more than presently indicated, we see nothing for the private utilities to be happy about; nor do we see anything for public power groups or co-ops to be disturbed about.

The Chief Reaction Is 'Wait and See'

The electric industry has greeted the new Republican power policy statement (EW, Aug. 24, p 102) with a generally cautious, "wait-and-see" attitude. While some strong opinions were voiced for and against the new Interior Department proposals, leading industry organizations like the Edison Electric Institute and the National Association of Electric Companies stated it was too early to comment. American Public Power Association took the same position.

Nearly everyone willing to be quoted had some qualms about certain portions of the policy laid down on Aug. 18 by Undersecretary of Interior Ralph Tudor and Assistant Interior Secretary Fred G. Aandahl. (For comparison of policies of this and previous administration see opposite page.)

Industry Views

Speaking as chairman of the Electric Companies Public Information Program steering committee, Robert E. Ginna said the statement points up the areas in which public acceptance still lags behind the facts on which a sound, balanced national power policy can be constructed.

Ginna, who is executive vice president of Rochester Gas & Electric Co, said the statement "unmistakably charts the direction in which the activities of PIP and other informational arms of the electric industry should be pointed in the immediate future."

He called for an intensification of information activities such as PIP and ECAP by enlistment of additional segments of the industry.

"An informed public opinion on both the national and local level," he said, "will now be more vital than ever to strengthen the hands of those who have the power and the will to implement the wishes of the people by their acts and influence."

Clyde T. Ellis, executive manager

FEDERAL POWER POLICY: How administration attitudes compare

Democratic (From statement by Interior Secretary Harold L. Ickes, Jan. 3, 1946)	*Republican* (From statement by Department of the Interior, Aug. 18, 1953)
Generation facilities	
"The (federal) project shall have its own steam standby and reserve facilities where necessary to independent operation on an economical and efficient basis. Facilities shall be designed and installed to provide the type of power and service required by public agencies and co-ops."	"The Department does not assume that it has the exclusive right or responsibility for the construction of dams or the generation, transmission and sale of electric energy in any area, basin, or region."
Transmission facilities	
"They (transmission facilities) must be owned and controlled by the government unless privately-owned facilities should be made available upon terms which assure full accomplishment of the basic objectives of the Congressional Power Policy and which do not reward the private company, simply because of its strategic location or monopolistic position."	"The Department of the Interior will construct and operate transmission lines that are economically feasible and necessary for proper connection and operation of federally owned generating plants. Transmission facilities will also be built and operated to carry power to load centers within economic transmission distances unless other public or private agencies have or will provide the necessary facilities."
Preference customers	
"No contracts shall be made that operate to foreclose public agencies and cooperatives from obtaining power from the government project . . . contracts with privately owned companies shall be limited in time and shall contain provisions for the cancellation or modification by the government as necessary to ensure preference to public agencies and cooperatives."	". . . The Department will give preference and priority to public bodies and cooperatives in disposing of electric energy generated at federal plants. It will be the policy of the Department to dispose of (remaining) power . . . to privately owned public utilities serving domestic and rural customers in the area."
Industrial use of federal power	
"A diversified development of the industries and resources of the region shall be given active encouragement in order to benefit the load factor and to promote the economic stability of the project as well as to aid in regional development."	"The Department will not ordinarily undertake to dispose of power directly to consumers except to carry out existing contracts or renewals or expansions thereof, nor will it use or permit the use of the preference privilege as a means to provide power for large industrial consumers at the expense of domestic and rural customers . . ."
Control over resale rates	
"Resale rate and other provisions shall be included in wholesale contracts with distributors to insure that power is furnished to the ultimate consumer at the lowest possible rates, which shall reflect as nearly as may be the cost of the service."	"Ordinarily in contracts with public agencies or cooperatives for the sale of electric energy no resale rate controls will be imposed (for sales to electric companies). Provision will be made to insure that power is furnished to ultimate consumers at the lowest rates."
Federal power rates	
"Allocation of costs on multiple-purpose projects shall not result in power consumers paying for facilities not fairly to be attributed to the operation of the power system, except as may be necessary to make the project feasible as required by law."	"Rate schedules will be prepared on a basis which will provide for the cost of producing and transmitting the energy and will return the capital investment in generation facilities together with interest in not more than 50 years."

of the National Rural Electric Cooperative Association, said the new policy will cost the farmers several million dollars a year on their wholesale power bills.

"It will mean," he said, "a longer wait for those not served and higher prices and perhaps inadequate supplies, for those already served."

However, Fred Strong, assistant to Ancher Nelsen, head of the Rural Electrification Administration, said the new policy would have "no effect at all on cooperatives."

The Editors

This difference of opinion on the statement was pointed up in editorials on the statement appearing in leading newspapers.

The New York Journal of Commerce stated that the Administration action "breaks the stranglehold the federal government held on the development of major power projects."

"In this particular instance," the editorial continued, "we believe that the important thing was that the Eisenhower-McKay policy declaration broke a trend that had been pushed hard by both the New Deal and Fair Deal."

Another financial paper, The Wall Street Journal, took an opposite view.

"When it comes to tell how the Truman policy is to be changed," the paper said, "the document becomes obscure and parts of it are expressed in loose generalizations which must evoke the admiration of devoted New Dealers. It affords only a few faint clues to the extent to which or the direction in which the Eisenhower power policy is to depart from that of the arch-advocate of federal electric power, Harry S. Truman."

The New York Herald-Tribune took a more moderate position, viewing the statement "as an indication of the way the wind is blowing throughout the wide range of government." The New York Times cautiously observed: ". . . we reserve judgment on the new policy until we see how it is carried out in the future."

The Legislators

While most legislators were out of Washington during the Congressional recess, some comment was forthcoming from Senate leaders.

Sen Guy Cordon, (R., Ore.), chairman of the Senate Appropriations Subcommittee for the Interior Department said:

"This is a clean-cut statement of Administration policy which is in line with that adopted and approved by the Senate for the past six years and possibly longer. Appropriations committees of both the House and Senate have time after time taken substantially the same view as expressed in the Administration statement."

However, Senator Cordon's Oregon colleague, Independent Sen Wayne Morse, denounced the policy as "another giveway through McKay of the nation's natural resources."

"The Eisenhower-McKay power statement," Morse said, "is but a verbiage cover-up for giving away of the public interest and rights in the public power facilities and potential power projects of the country."

Morse was seconded by Sen Estes Kefauver (D., Tenn.), who said this new policy is "entirely unsatisfactory" and "only a restatement of a program which would be destructive of TVA, REA and other public power operations in the nation."

"It would put the public back where it was in 1933, securely in the hands of the power trust," Kefauver said.

Pacific Northwest

Assistant Secretary Aandahl, who had a hand in developing the new policy, said that only in the Pacific Northwest did he find the public critical.

"There is, however," he said, "a growing feeling in that area that local interest should take over with less dependence upon the federal government."

Among private power companies in the Northwest the feeling was that the policy marked a turning. Take this comment by Thomas W. Delzell, chairman of the board of Portland General Electric Co:

"It is a constructive step toward interpreting the existing laws governing federal power developments according to the original intent of Congress in passing them, and a return to the precepts of the U. S. Constitution.

"As we read the published reports, it appears that the partnership principle is the essence of the new federal policy. Naturally we approve it wholeheartedly."

Clark County (Wash.) Public Utility District Manager V. M. Cleaveland viewed the new policy as a clear-cut directive for local public distribution systems to seek their own sources of energy supply. He said Clark PUD, together with five other southwest Washington public systems, already has moved toward forming an agency to study project possibilities.

James T. Marr, Oregon AFL secretary and president of the National Hells Canyon Association which favors a big federal dam on the Snake River instead of low-head structures proposed by Idaho Power Co, declared:

"There is nothing new in the Interior department's so-called new policy. It is merely an extension of the program advanced by Secretary McKay when he decided to let the Idaho Power Co take over the Snake River. The new policy merely confirms the giveaway as part of the Administration program. People of the Northwest will not stand for a program which fails to provide for the construction of multipurpose dam projects."

This was echoed by Jess A. Bell, vice president of Oregon CIO Industrial Council and secretary of the Portland CIO Council:

"It apparently means the power development program through the building of multipurpose dams started by President Roosevelt with the building of Bonneville Dam is being scuttled as part of the Republican giveaway policy."

The Farmers

On the farm front, a couple of organizational leaders took a different tack from NRECA's boss Ellis.

Herschel D. Newsom, master of the National Grange said:

"We don't find any fault with the Interior statement at all. It seems to leave the door open for public power development where that is needed, but at the same time it does not close the door to private power development."

A responsible official of the American Farm Bureau Federation, who declined to be identified, commented:

"There are many elements in the Interior statement which are consistent with the policy of the Farm Bureau."

On the other hand, James G. Patton, president of the National Farmers Union, called it "a total surrender to the electric company lobby."

"The only concession that it makes to the public interest," he said, "is to screen its real content behind catchwords that have been invented and well-worn in the service of private utility propaganda."

New Policy Already in Practice

Secretary McKay cites Interior's Hells Canyon stand as action in line with Republican principles on power

Several "for examples" in which the Department of Interior has already acted under the principles of its newly announced power policy were outlined by Secretary Douglas McKay during a speech in San Francisco on Aug. 21.

As instances of the Bureau's continuing interest in "sound reclamation and power projects," he cited its recommendation of the construction of the Arkansas-Fryingpan multipurpose project in Colorado and its award of a $7 million contract for construction of Monticello Dam in California.

Also, Secretary McKay noted the Bureau's withdrawal of support for the Hells Canyon project.

Turned Down Twice . . . In this case, he declared, the Bureau had been supporting a project which Congress had "specifically failed to approve on two occasions."

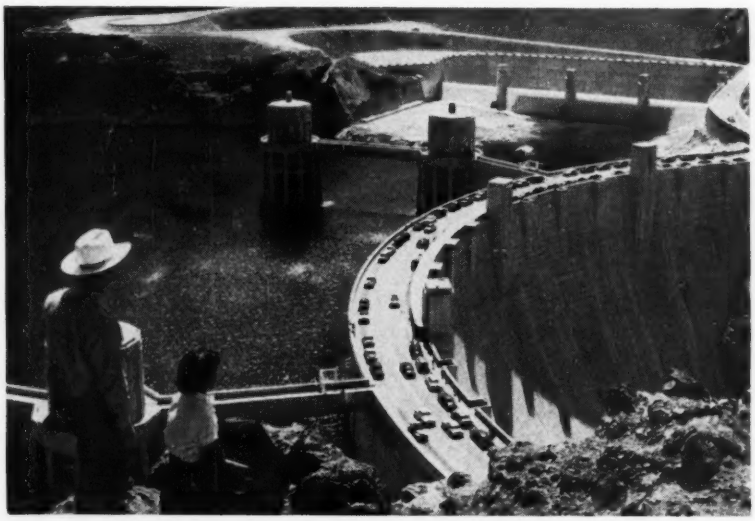
"We do not even have a Congressional authorization," he said, "to construct a project at Hells Canyon and obviously very little chance of obtaining the necessary hundreds of millions of dollars to build such a project in the near future even if it were authorized.

"Under these circumstances the department simply withdrew itself as a protestant before the FPC. We are continuing to furnish the FPC with every bit of information at our disposal. We are simply recognizing the Commission as a legally constituted judge in the matter."

Slap at Oscar Chapman . . . McKay sharply criticized his predecessor's protest of the FPC-approved application for development of California's Kings River by the Pacific Gas & Electric Co.

Pine Flat Dam—which will make power development of the North Fork of the Kings feasible—is now nearing completion by the Army Corps of Engineers as a flood control and irrigation structure, he pointed out, but the power development has been held up while a protest initiated in the former administration is argued in the courts.

"Look what happens when one department of the government intervenes," he exclaimed. "The case drags out in court which must have months or years to consider the testimony. In the meantime the area goes without vitally needed electric power."



The Water's Down at Hoover Dam

This year's low water mark at Lake Mead behind Hoover Dam (note eroded strata on far bank) will not keep irrigation requirements and firm energy allotments from being met, Bureau of Reclamation officials said last week. But there will be no secondary (cheaper) power, which is generated when the level of the lake is high. This year's highest level, reached July 13, was 1166 ft—second lowest maximum in the lake's history. This year's storage of 19 million acre-ft falls far short of last year's 23.7 million acre-ft. Inflow into Lake Mead this year was only 5.4 million acre-ft, a sharp dip from the normal 9 million.

Detroit Edison, Ontario Hydro Ready Interchange

Exchange of electric power between Detroit Edison Co and the Ontario Hydro-Electric Commission is expected to begin shortly. The American utility has already asked the Federal Power Commission to approve the agreement under which it would export power to Canada at certain times and import it at others.

Connecting towers are already up. Once cables are in place, the hookup will be complete. The international system will have a transmission potential of 300,000 kw.

A cable will stretch from a 302-foot tower at Detroit Edison's Delray Plant to another tower in Windsor, Ont. Towers at Sarnia, Ont., and Marysville, Mich., also will be connected.

Prentiss M. Brown, chairman of the Detroit Edison board, pointed out that should disaster strike either of the connecting links, the other will be able to carry the load and maintain a flow of power.

Detroit Edison will tap the Ontario system during spring when water levels are high. Under normal operation, Edison then will repay Ontario in summer months when water levels in Canadian dams are running low.

TVA Reveals Staff Cut

Tennessee Valley Authority plans to discharge 50 of the 250 persons employed in its resource development program. Ninety posts in the program have been abolished, but of these 40 persons have been reassigned to other Authority divisions in which vacancies or new positions exist. Almost all of the program's 250 employees were recently given provisional dismissal notices effective Aug. 29, but now only 50 of them will remain in effect.

Power Pacts . . .

are sought for interim between Southwestern co-ops and Interior Department

An air of cautious optimism prevailed as officials of the Interior Department and southwestern rural electric cooperatives last week continued negotiations on interim power contracts.

Representatives of both the co-ops and Interior expressed belief that short-term agreements could be reached which would permit at least two of the generating and transmission co-ops to provide power and transmission facilities for use by Southwestern Power Administration, an Interior agency.

Up for immediate negotiation are contracts between SPA and Western Farmers Electric Cooperative of Oklahoma and Central Electric Power Cooperative of Missouri.

Three Co-ops Unaffected . . . Three other G.&T. Co-ops are not immediately affected because their facilities are not completed. A sixth, Sho-Me Electrical Cooperative is to use part of Central Electric's facilities.

When completed, the interim agreement will replace the lease-purchase power contracts between the co-ops and SPA (voided by Congress).

In approving SPA appropriations for the present fiscal year, Congress prohibited use of funds for the lease-purchase agreements involving six G.&T. co-ops and SPA. Instead of allowing the $3.1 million needed to carry out the contracts for this fiscal year, Congress voted $1.2 million to SPA for purchase of firming power, lease of transmission facilities, and payment of wheeling fees. Congress prohibited the use of funds for these purposes after Feb. 28, 1954.

Purchase Potential Cut . . . The G.&T. co-ops immediately affected have in operation sizeable generating and transmission facilities which were to be used by SPA under the old contracts. The agreements now under negotiation will permit SPA to buy only a limited amount of output from the co-op plants and to lease a portion of the transmission lines.

The contracts will cover only the period between now and next February 28 because of the cutoff date. After that, other arrangements will have to be made because SPA will not have funds available for the purchase of power and lease of lines.

Negotiations hinge on two issues:

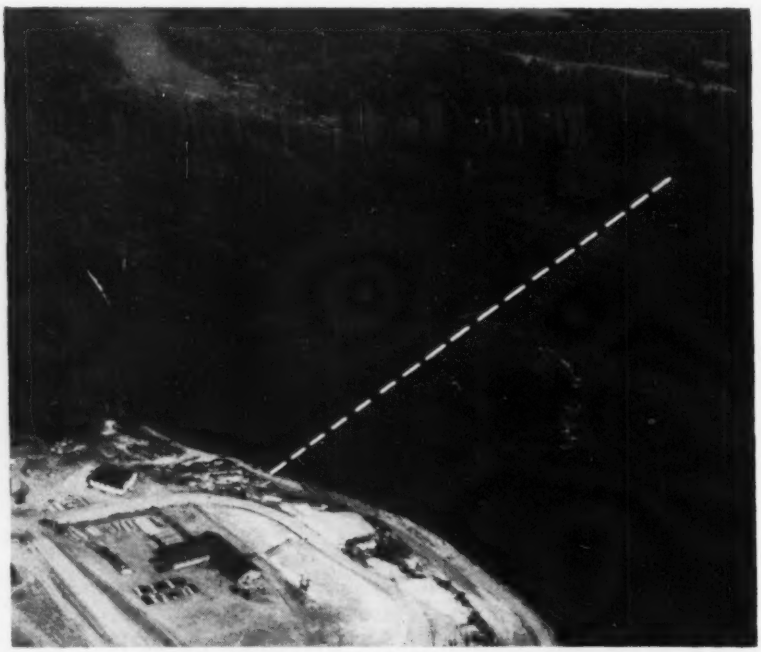
- How much can SPA pay for lease of the co-op transmission lines or for "wheeling" charges.
- How much steam-generated electrical energy can SPA buy to firm the output from its hydroelectric plants.

Extra Facilities . . . In the case of Western Farmers Electric Cooperative of Oklahoma, the facilities are ready for operation. But in the present situation, Western has transmission and generation capacity considerably beyond its immediate needs. Under the ineffective contracts, this would have been used by SPA. Goal of the interim contract is to make as much use of this capacity as possible.

Central Electric Power Cooperative of Missouri has much less surplus capacity, and negotiators appear to believe that an interim contract for this co-op will be less difficult.

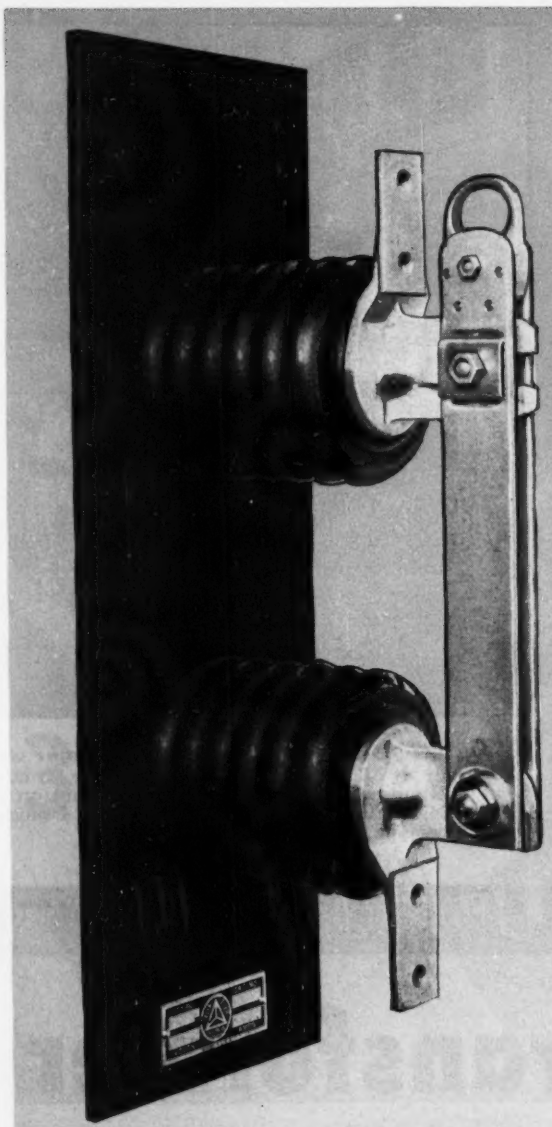
CONTRACTS OUT FOR FISCAL 1954

G. & T. Co-ops	Power and service charges	Transmission rentals	Total	Miles of line
Western Farmers Electric Cooperative	$539,700	$351,000	$890,700	933.5
Central Electric Power Cooperative	589,500	469,000	1,058,500	520.0
Kamo Electric Cooperative	.....	180,000	180,000	556.6
N. W. Electric Power Cooperative	789,000	158,000	956,000	252.0
Missouri and Arkansas Electric Power Co-op	14,900	.....	14,900	....



Roanoke Rapids Dam Work Advances

Clearing work for dam site at Roanoke Rapids, N. C., for Virginia Electric & Power Co's 91,000-kw hydro plant is under way. Aerial photo shows access roads and contractor's and construction buildings. Dotted line indicates approximate location of dam. River rock will soon be blasted out at dam tail race location to increase head by 20 ft. Completion of project is slated for late 1956. Total estimated cost is $30 million.



DELTA-STAR

400 to 1200 ampere
INDOOR DISCONNECTING

SWITCHES

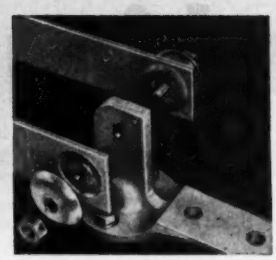
ENGINEERED FOR QUALITY AND LASTING PERFORMANCE

The complete line of Delta-Star indoor hook operated disconnecting switches are the result of thorough engineering which incorporates all the best features of disconnect design. Every detail has been proved in the field by years of successful service with minimum maintenance required.

Simple, Sturdy Construction

- **Full floating, double blade, tongue type construction assures perfect alignment of all contact points.**
- **Multiple, high pressure silver to silver jaw contacts with pressure equally distributed by means of non-ferrous spring washers, compressed by a single bolt passing through the center of the tongue provides clean, positive, high pressure, low resistance contact for the life of the switch. This construction effectively ties insulators together to resist short circuit stresses.**
- **High pressure silver to silver annular ring hinge contacts wipe clean as blade moves.**
- **Positive bolt type lock. Effectively prevents blade opening.**
- **Insulator units. Modern cemented insert type, meets NEMA standards and are available in several strength classes.**
- **Terminal lugs. Solder of clamp type as required.**
- **Ratings. 5 kv to 34.5 kv, 400 amperes to 1200 amperes.**
- **For full particulars, ask for publication 4905. For switches rated 2,000 amperes and above, see publication 5101.**

CLIP CONTACT ASSEMBLY
High Pressure Tongue Type

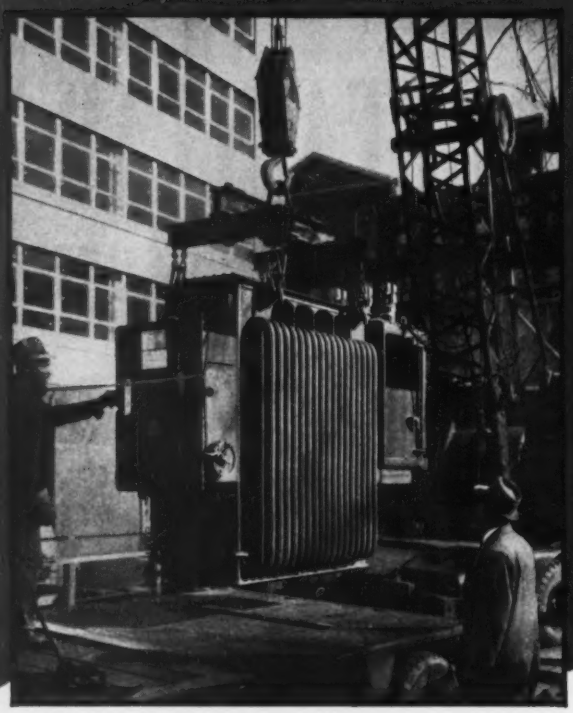


HINGE CONTACT ASSEMBLY
High Pressure Annular Ring Type

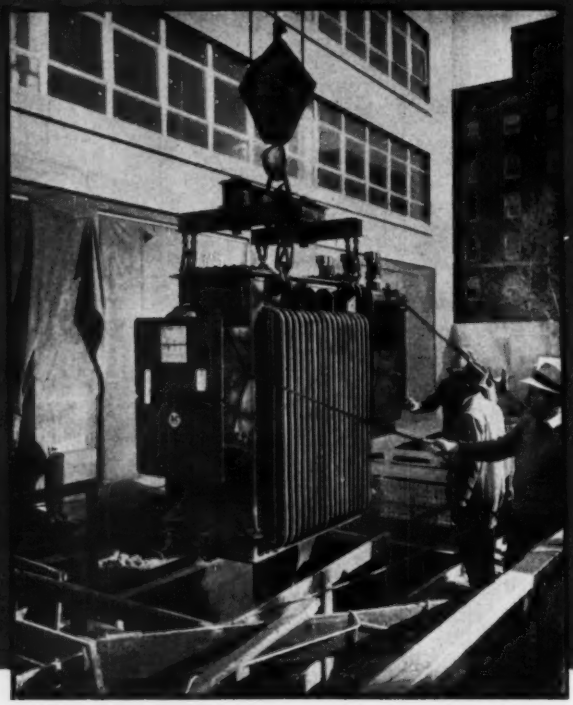
WHEN YOU WANT THE BEST IN HIGH VOLTAGE SWITCHES, SPECIFY DELTA-STAR

DELTA-STAR ELECTRIC DIVISION

H. K. PORTER COMPANY, INC.
2437 FULTON STREET, CHICAGO 12, ILLINOIS
DISTRICT OFFICES IN PRINCIPAL CITIES



1 **New Network Transformer Installation** provides principal power supply for new office building. Pictures show transformer being moved to site and being installed.



2 **This 750-kva Network Transformer** will supply all electrical service except for air conditioning motors. Location is at junction of Connecticut Avenue and "K" Street, 4 blocks from White House.

A Network Transformer Goes to Washington!

ALLIS-CHALMERS TRANSFORMERS USED ON POTOMAC ELECTRIC'S SYSTEM

Allis-Chalmers is proud to help serve on the fine network system of the Potomac Electric Power Company. Having had 15 years' experience with Allis-Chalmers network transformers, this utility has found them to give highly efficient performance.

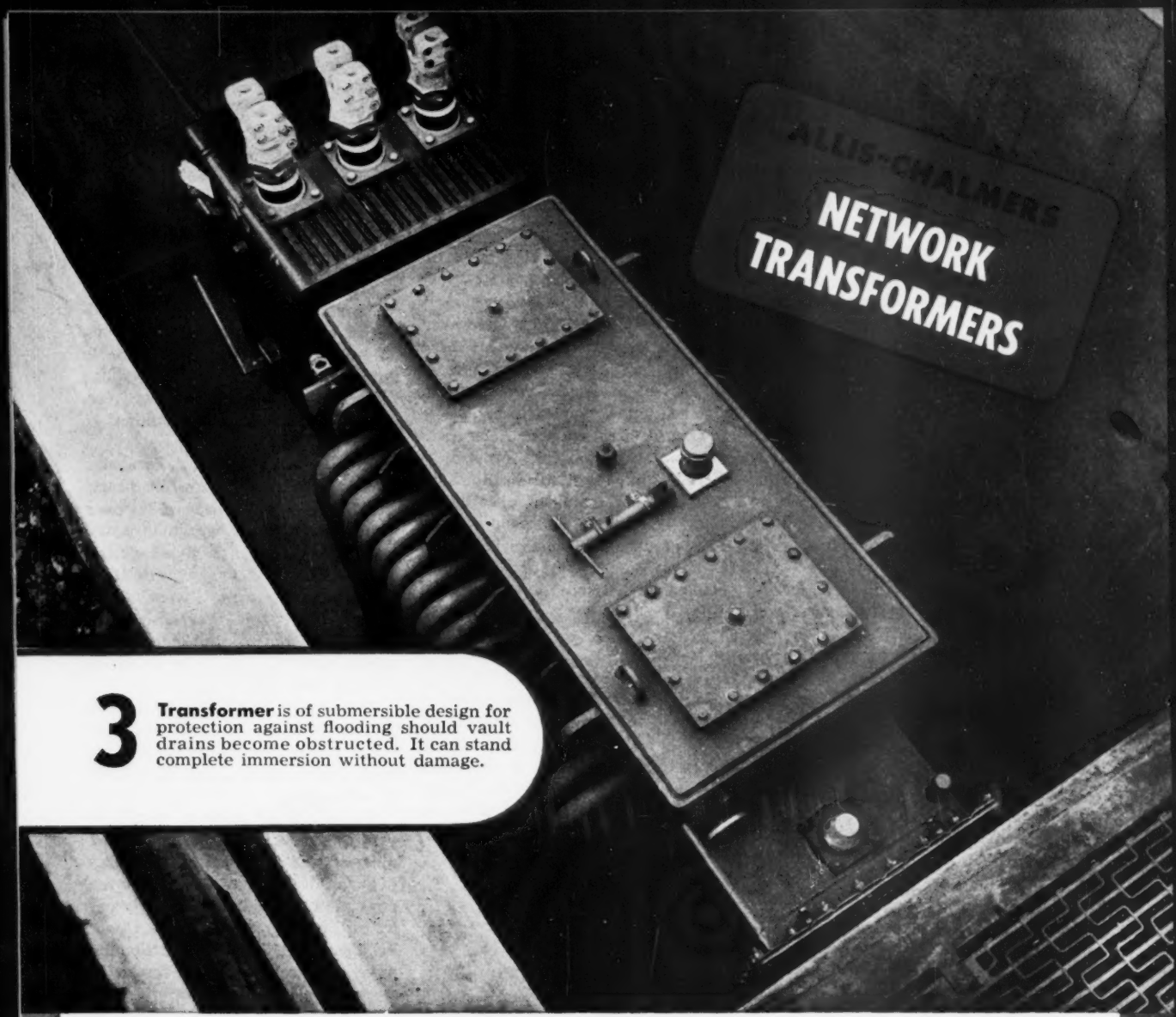
Excellence in construction detail is a major reason why Allis-Chalmers network transformers are chosen by so many utilities. Over 1¼ million kva of these units are now serving the nation's most important systems. Compact, low-loss design and high thermal capacity of Allis-Chalmers network transformers meet the severest load conditions.

See your nearest A-C district office for more details or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4010

ALLIS-CHALMERS

A-C ALLIS-CHALMERS



3 **Transformer** is of submersible design for protection against flooding should vault drains become obstructed. It can stand complete immersion without damage.

Here are Reasons Why the System Will Benefit

Spiral Wound Gaskets Are Performance Proved

In over 5 years of continuous use, spiral wound gaskets have proved their superiority over other types of gasket material for sealing bushings in the tank wall.

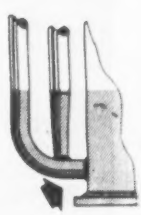
Alternate plies of preformed spring-like metal and non-metallic fillers provide unusual resilience that actually adjusts itself to changes in operating conditions. This gasket, installed without the use of cements or grease, simplifies the removal of bushings if required. The gasket may be re-used if necessary.

Weld-Seal Construction Eliminates Major Gaskets

The main cover and switch compartment are welded to the tank to eliminate leaks. Oil sludging and oxidation of insulation is minimized.

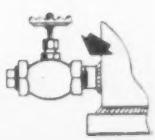
Special Surface Treatment Provided

Areas that may be exposed to severe corrosive conditions are thoroughly protected. Tank surfaces are grit-cleaned and given three coats of baked-on phenolic paint (formulated for moisture resistance). A special bituminous compound gives added protection to surfaces and tubes in base areas.



Threaded Valve Connections Are Solder-Wiped

Threaded valve connections are solder-wiped for extra protection. Valves are located for maximum accessibility. Globe type valves with non-rotating seats close tight, avoiding wear on valve seats.



Electricity Cutoff Looms . . .

in Michigan's upper peninsula, as power supplier makes ready to get out of business. Two affected cities and cooperative work towards developing new sources

Michigan's economically distressed upper peninsula is confronted with a lack of electric power that could prove as disastrous to its communities as have mining and lumber industry losses in the past.

The shortage has long kept new industry out and is threatening the existence of industrial plants already operating in the area. To meet the situation, two cities and a cooperative faced with losing all power sources, are working towards supplying their own power.

Notice Given . . . Their move was made necessary last fall after the Mead Corp, with which the Upper Michigan Power & Light Co is affiliated, notified the cities of Escanaba and Gladstone, and the Alger Delta Co-op that it wants to withdraw from the power business. Reason: It needs all its electrical energy to supply its own pulp and paper mill operations.

Escanaba's contract with Upper Michigan P&L, which has 1,200 customers including large industrial users, expires on Aug. 31, 1959. Gladstone's contract expires on July 31, 1954. Neither contract will be renewed and officials of both cities were asked to find other power sources.

Last October, city and Alger Delta representatives took the problem to Washington. The Rural Electrification Administration notified the parties that it would not finance power facilities for the cities but might provide for expansion of the co-op, which could then sell surplus power to the cities.

Delay Indicated . . . Co-op officials have since indicated that an REA loan would be delayed pending further study of its system, and presentation of contracts from Gladstone and Escanaba. Alger Delta is preparing to offer a five-year contract, if and when its plant is erected. Renewal of such contracts is less definite.

The city of Gladstone, working rather closely with Mead Corp, has since had studies made which indicated that a steam electric plant would best serve the city's needs. The plant, using two 3,000-kw generating units, would cost about $2-million and take about 18 months to complete, if the project is approved by voters. Mead Corp has made a tentative agreement to buy surplus power from the Gladstone plant when and if it is built. Mead further agreed to continue to supply power to the city beyond the contract expiration date next year, until the plant goes into operation.

Escanaba Studies Plant . . . Escanaba, not as pressed for time as Gladstone, also has had a study made of its power problem. Engineers here, too, recommended building of a steam electric plant with two 7,500-kw generators.

In recent months, Escanaba has completed a couple of expensive public works projects. Voters likely would have little inclination to saddle the city with another project.

With that in mind, city officials are making efforts to move jointly with Alger Delta. The co-op has filed an application with REA for $6,850,000 in loan funds.

The funds, if granted, would be used to build a steam plant, about 62 miles of transmission lines, 885 miles of new distribution lines to bring power to most of 2,800 presently unserved farms, and to purchase Upper Michigan P&L's rural distribution lines. REA reportedly is favorable to the application at this point.

Ebasco Makes Study . . . A recent economic study made for the Michigan Department of Economic Development by Ebasco Services, Inc, revealed that total steam-electric, hydro-electric, and internal combustion engine capacity in the upper peninsula is 233,612 kw.

Eight major suppliers furnish 93% of total electric power capacity, the balance coming from municipally-owned plants. Ebasco determined that there is an immediate need for about 30,000 kw more capacity for present customers. Expansion of mining and other operations will require an additional 50,000 kw in the next 10 years.

Ebasco suggested that the most feasible approach would be to construct a large steam-electric generating plant, centrally located, from which utilities could draw added power.

Digby Takes Oath as FPC Member

Seaborn Lee Digby, left, newest member of the Federal Power Commission, took the oath as commissioner this month. Administering the oath was Harold M. Stephens, chief judge, U. S. Court of Appeals, District of Columbia circuit, while Jerome K. Kuykendall, chairman of FPC, watched. FPC is now at full five-member strength.

WHEN ORDERING
HIGH VOLTAGE
CABLE SPLICING
MATERIALS SEPARATELY...

you're Wasting Time

...IF YOU GO
THROUGH ALL OF
THESE STEPS WHEN
ONE WILL DO

Simply give us complete cable data and you receive a neat package with adequate quantities of all materials for a properly designed joint.

You save time and money because . . .

No lengthy material specifications are necessary.

Both design and installation methods can be standardized.

All joints are properly designed to industry standards by expert cable engineers.

All splicing materials are purchased from one source.

Each kit packed in convenient size box. Easy to store, identify and handle.

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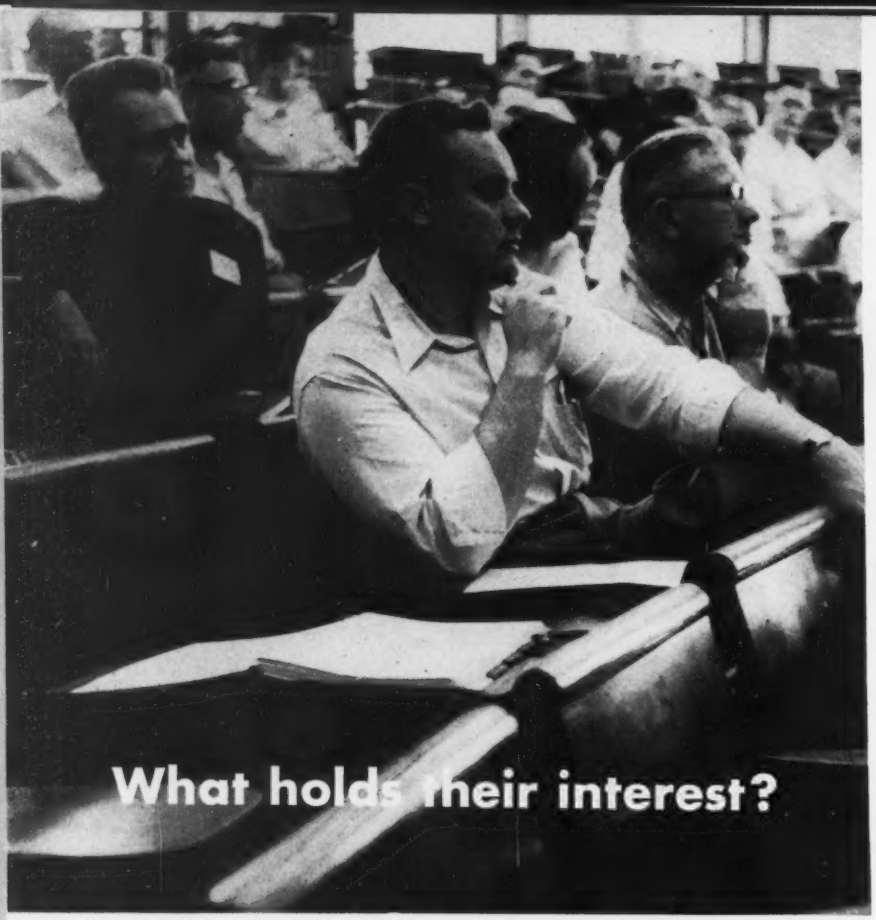


These GE fellowship winners at Case Institute are taking a . . .

Refresher in Physics

For the seventh summer, a group of 50 secondary school teachers this year were brought to Case Institute of Technology in Cleveland to find out the latest developments in physics.

The six-week course in which they participated is part of General Electric Co's Science Fellowship Program. It has a dual purpose—to refresh the teachers' knowledge of their subject and equip them to stimulate scientific ambition in their students.

GE picks up the tab for the group's living and travelling expenses, tuition and books. The company also makes its own personnel and facilities available to fill out the schedule of lectures and show how physics is put into use. But details of the program are left up to the Case faculty.

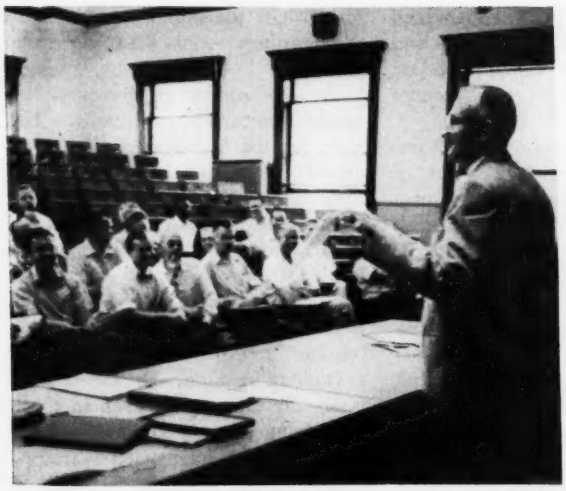
Dr. Leonard O. Olsen, member of the Department of Physics and director of the GE fellowship program at Case, sent out more than 6,000 letters early this year to high school principals and superintendents. He asked them to recommend outstanding physics teachers from their school who might become applicants for the fellowships. As a result of the letter, between 150 and 200 teachers applied to Case. Since the group is limited in size to 50, a 4-man faculty committee screened the applications. Seven women were included in this year's enrollment.

Applicants Screened . . . Educational background of the applicants is the primary consideration, according to Dr. Olsen. The committee also takes

(*Continued on page* 18)

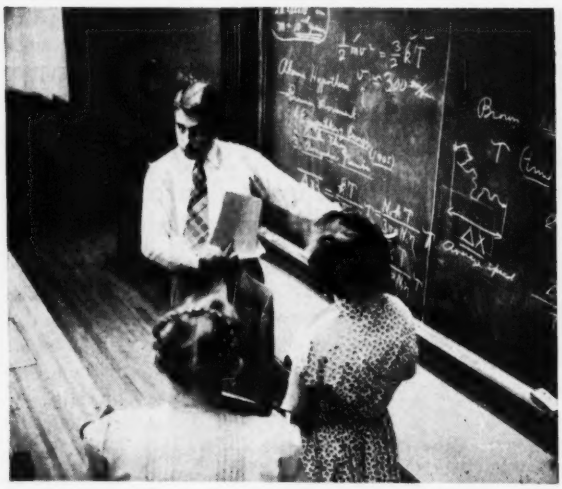
RELAXATION is afforded teacher-students in Case dormitories, in faculty dining room at the student union (above) and at the . . .

. . . GE LIGHTING INSTITUTE at Nela Park, near Cleveland. Here, after visits to Lamp Division labs, group rests before returning to Case

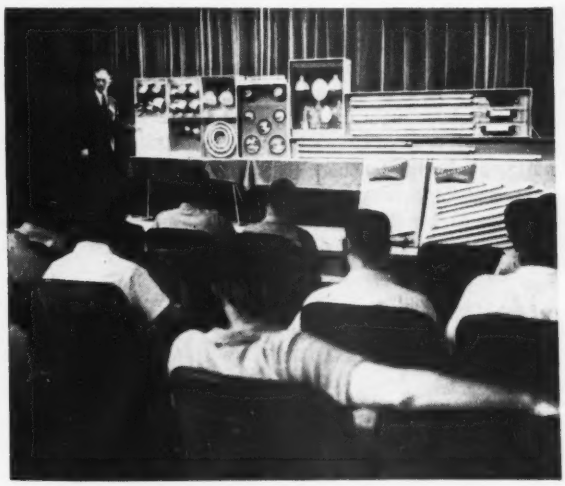


1 TEACHING AIDS that General Electric Co make available to schools are described to refresher group by George A. Reitz

2 TEACHER-STUDENTS "take ten" between class lectures to bull about physics and the lot of low-salaried teachers in public schools



3 AFTER LECTURE, Dr. Robert S. Shankland, head of Case Physics Department, explains an equation to several members of the group



4 SETTING SHIFTS to GE's Nela Park, where group hears engineer describe lights made by company as preliminary to lab visits

5 GROUP SPLITS into sections to tour GE labs. Above, one section hears W. W. Kirk describe tests on sealed-beam headlights

6 TEST SECTION in the Lamp Division is visited by another group, which pauses beside bank of lamps mounted on life-test racks

Fellowships

(*Continued from page* 17)

a look at age—it wants teachers who have been out of college long enough to have gained good teaching experience, but who are not close to retirement. Geographical distribution of the applicants is also considered. Students came from 12 surrounding states. Both large and small school systems are represented, though Case limits its list of contacts to schools with a minimum of 100 pupils.

Curriculum . . . Three separate subjects are covered in the six-week course. Basic Concepts of Physics, taught by Dr. Olsen, covers subjects like mechanics, thermodynamics, electricity and magnetism, and puts emphasis on the physical interpretation of experiments and problems. The course consists of five hour-long lectures each week.

Development of Atomic and Nuclear Physics, taught by Dr. Robert S. Shankland, head of Case's Physics Department, brings teachers up to date on recent happenings in the field. In addition to five lectures a week, the course includes two demonstration laboratories. In them, Dr. Shankland shows the teachers how to set up and conduct laboratory experiments on subjects like electrons and vacuum tubes.

Science and Engineering in the Control of Environment is a series of three weekly lectures plus two inspection trips. It is conducted by Russell C. Putnam of Case's Department of Electrical Engineering. It is this course that brings the teachers into close contact with GE scientists and engineers. At Nela Park, headquarters of GE's Lamp Division and Lighting Institute, the teachers listen to GE scientists and engineers discuss topics like "Physical Problems in Designing Light Sources," "Fundamentals of Light, Vision and Seeing." In addition, the group tours many of the labs and the factory buildings to see how physics is applied in industry. Trips are also made to research laboratories in the Cleveland area.

Nela Camp Used . . . After a full day of classes and field trips, the teachers are free to make use of recreational facilities at Nela Camp. Some evenings, guest lecturers are brought to the Case campus. Usually, the evening winds up with bull sessions in the dormitory rooms where the group is housed.

At the end of the course, the teachers received certificates. This year, for the first time, they also received pins from GE. "Alumni" fellows learn of each other's activities through a newsletter published by GE. In some areas, the fellows have formed their own small groups.

Reunion . . . This summer 125 "alumni" returned to the campus for a two-day reunion. Dr Olsen, who personally manages to keep in touch with many of the "alumni", sparked the plan and immediately aroused interest among a number of teachers.

GE started its Science Fellowship Program in 1945, gathering a group of 50 high school physics and chemistry teachers together at Union College in Schenectady. The idea caught on, and seven years ago the company instituted a similar program at Case.

Changes in Capacity Reported to FPC

PLANT ADDITIONS DURING JUNE

State	Utility	Plant	Fuel	Capacity (kw)
Vt.	Green Mountain Power Corp.	Waterbury	H	5,500
Mass.	Braintree Electric Light Department	East Brain	S	10,000
R. I.	Island Light & Power Co.	Block Island	IC	196
Ill.	Illinois Power Co.	Hennepin	S	60,000
Ill.	Iowa-Illinois Gas & Electric Co.	Moline	S	25,000
Mich.	Wisconsin Michigan Power Co.	Michigamme Fls.	H	4,800
Mo.	Kansas City Power & Light Co.	Hawthorn	S	100,000
Neb.	Red Cloud Electric Department	Red Cloud	IC	926
Kan.	Hill City Municipal Water & Light Plant	Hill City	IC	675
S. C.	United States District Engineers	Clark Hill	H	40,000
Ky.	Tennessee Valley Authority	Shawnee	S	135,000
Tenn.	Tennessee Valley Authority	Boone Dam	H	25,000
Ark.	Corps of Engineers	Bull Shoals	H	40,000
La.	Gulf States Utility	Louisiana 2	S	60,000
La.	Franklin Municipal Plant	Franklin	IC	920
Okla.	Fort Gibson Project	Fort Gibson	H	11,250
Tex.	Houston Lighting & Power Co.	Greens Bayou	S	100,000
Tex.	West Texas Utilities Co.	Concho	S	30,000
Ariz.	Tuscon Gas, Electric Light & Power Co.	De Moss-Petrie	S	20,000
Ore.	California Oregon Power Co.	Clearwater	H	15,000
Calif.	Lost Angeles Department of Water and Power	Upper Gorge	H	37,500
Calif.	California Oregon Power Co.	Trinity Center	IC	100
Calif.	California Oregon Power Co.	Happy Camp	IC	100

PLANT RETIREMENTS DURING JUNE

Penn.	Schuylkill Haven Electric Light Department	Schuylkill	S	3,250
Ind.	Brookston Municipal Light Co.	Brookston	IC	720

H—Hydro, IC—Internal Combustion, S—Steam
United States Capacity as of July 1—Hydro, 21,027,585 kw; Internal Combustion, 2,123,744 kw; Steam, 61,899,401 kw; Total, 85,050,730 kw.

Colorado Board Rejects USBR Dam Project

The Colorado Water Conservation Board has rejected U. S. Bureau of Reclamation plans for construction of a $51 million multipurpose dam across the Rio Grande River in the San Luis Valley of southwestern Colorado.

Gov Dan Thornton in a letter to Secretary of the Interior Douglas McKay said Colorado feels the Wagon Wheel Gap project is necessary but called for a complete restudy of it. He termed it "entirely too ambitious and costly."

The Bureau proposed that the dam would develop 106 million kwhr of power annually and would provide water for 271,000 acres of irrigated land. The proposed 430-ft dam, the Bureau said, would provide flood control and recreation benefits for southern Colorado and northern New Mexico.

Originally suggested in 1940, the Wagon Wheel Gap Dam was estimated as a $13 million project at that time. Secretary McKay has asked the governors of Colorado, Texas, and New Mexico for their views on the project.

Thornton is the first to respond. His report followed policy hearings by the board and its analysis of the planned project.

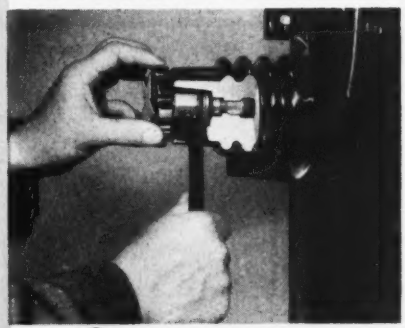
Pole Star .. BEST BY FAR

3 more reasons why . . .

1—The Pole Star CORE AND COIL UNIT CAN BE TAKEN APART AND REBUILT

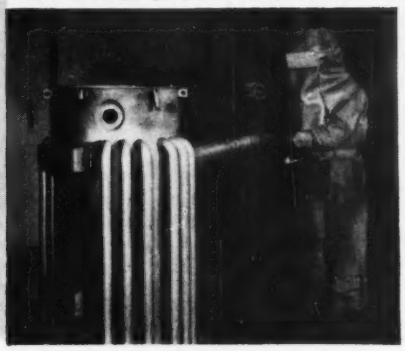
If a coil is damaged by lightning or excessive overloading, cores can be taken apart and rebuilt with replacement coils. This can be accomplished without appreciably affecting the low core loss or low exciting current of the Pole Star.

2—The Pole Star SIDEWALL BUSHINGS ARE ELECTRICALLY CO-ORDINATED



The Basic Impulse Level of each bushing is co-ordinated with the transformer windings. When the transformer is subjected to a voltage surge above the BIL of the bushing, the bushing will flashover on the outside. A separate, completely co-ordinated bushing is available for each voltage class — 5 Kv and 8.6 Kv.

3—The Pole Star TANK AND COVER ARE SHOT BLASTED *THEN* PAINTED



Three coats of transformer paint are individually applied and individually baked onto the tank *only after* the tank is cleaned with steel grit to positively remove scale, grease and dirt from the tank surface.

Pole Star Transformers are available in a complete range of distribution sizes — 3 to 500 Kva, 2400 through 67,000 volts. For detailed information, write to Pennsylvania Transformer Company, Box 330, Canonsburg, Pa.

PENNSYLVANIA TRANSFORMER COMPANY
A McGRAW ELECTRIC COMPANY DIVISION
CANONSBURG, PA. • *Greater Pittsburgh District*

Why L-M Round-Wound Transformers Have Such High Short-Circuit Strength

by **JAMES G. EVERHART**
Chief Engineer
Transformer Division
Line Material Company

One of the desirable characteristics of L-M Round-Wound transformers is their exceptionally high short-circuit strength. Partly this is inherent in the way we wind round coils on a wound core. But further, this strength arises from the exceptionally good mechanical design.

Effects of Short Circuits

Short circuits exert two forces—radial and axial. Under radial forces, rectangular coils tend to assume a round shape. Being already round, the coils on Round-Wound transformers resist these radial forces much better than do rectangular coils. (Figs. 1 and 2).

Axial forces tend to telescope the windings. Although failure is progressive, it can occur almost instantaneously. If the coil starts to telescope, the electrical centers of the coils are abnormally displaced. This results in a greater axial component which increases the force and the movement, leading to complete failure. (Figs. 3 and 4).

In larger transformers the mechanical forces involved can amount to thousands of pounds. Therefore in Round-Wound transformers we pay special attention to providing a mechanical structure sufficiently strong to support and hold the coils in position in the assembly.

This structure requires a rigid steel frame, firmly tied together vertically (Fig. 5), and properly designed blocking (Fig. 6). Even leads must be strongly clamped (Fig. 7), since great mechanical forces may exist between adjacent leads.

Varnish Selection

Correct application of the proper varnish provides a bond between layers of insulating paper and coil sections which contributes to short-circuit strength. We have developed a variety of tests for varnish, including a mechanical test of bonding strength. (Fig. 8). These tests enable us to select those few varnishes which combine the highest mechanical and electrical strength with other desirable qualifications.

The overall result of design, construction, selection of materials, and careful manufacture has given L-M Round-Wounds unusually high short-circuit strength, which contributes to an extremely low rate of failure.

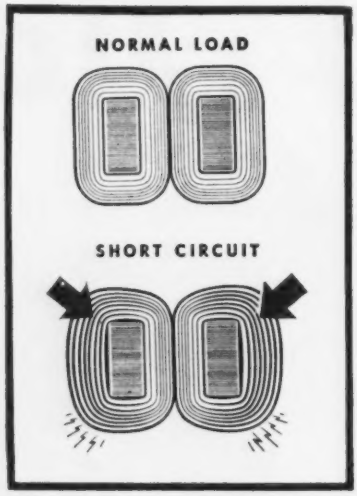


FIG. 1. Radial forces existing under short-circuit currents make rectangular coils tend to become round. The forces may be violent enough to damage insulation, or may completely destroy the coils.

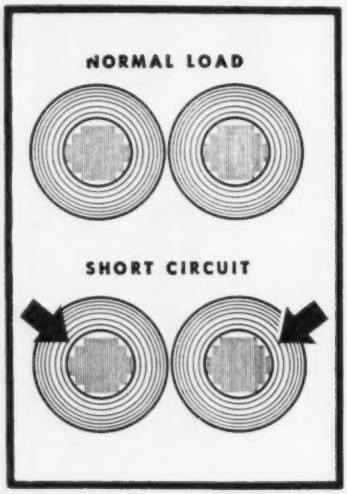


FIG. 2. Since the coils of Round-Wound transformers are already round, short-circuit radial forces cause no distortion. Thus Round-Wounds have inherently higher short-circuit strength.

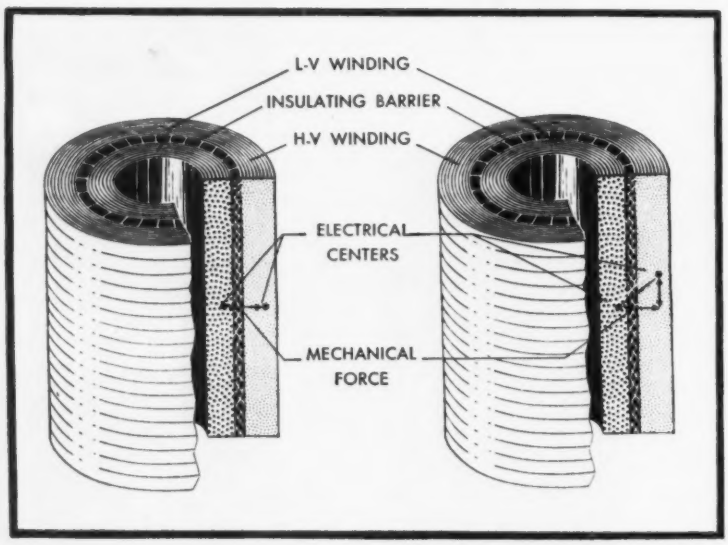


FIG. 3. Diagrammatic vertical section of coil showing primary and secondary electrical centers on the same horizontal plane. Under short circuits, all forces are radial and windings tend to repel each other in a horizontal plane. But even though coils can be designed with the electrical centers on the same plane, manufacturing tolerances cause some variations; and tap changer operations will cause some unbalance.

FIG. 4. With electrical centers displaced vertically, the force between the centers has both radial and axial (vertical) components. Axial forces cause the windings to telescope and separate vertically. Any displacement increases the vertical force component between them, which progressively compounds to complete destruction of the coils. The rigid construction of Round-Wound transformers prevents the slightest movement.

LINE MATERIAL Transformers

Compare the Things That Count

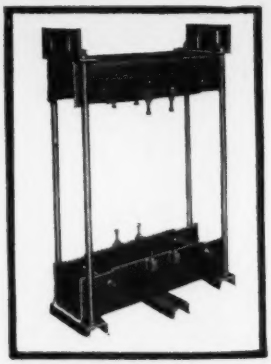


FIG. 5. Heavy steel frame provides a rugged mechanical structure that is firmly tied together vertically. It is sufficiently strong to support and hold coils in position in the assembly.

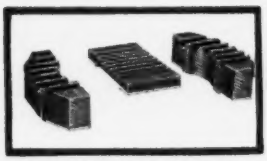


FIG. 6. Sturdy kiln-dried, oil-impregnated, shaped maple blocks give maximum contact and support to coil-edge surfaces. These are assembled and clamped so that they cannot move out of position under short-circuit forces.

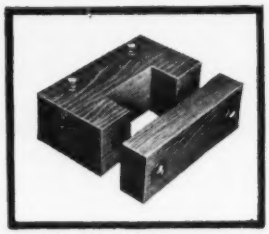


FIG. 7. Under short-circuit conditions, great mechanical forces exist between adjacent leads—especially in large transformers. These leads are strongly clamped so they cannot be harmfully displaced.

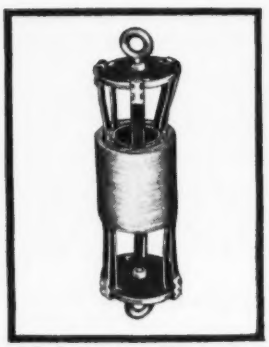


FIG. 8. Here is a coil impregnated with a test varnish set up for a pull test—which will determine whether the varnish has adequate bonding strength. This is just one of the tests L-M has developed to select the best varnishes for Round-Wound transformers.

"Round-Wound" is a Line Material Company trademark

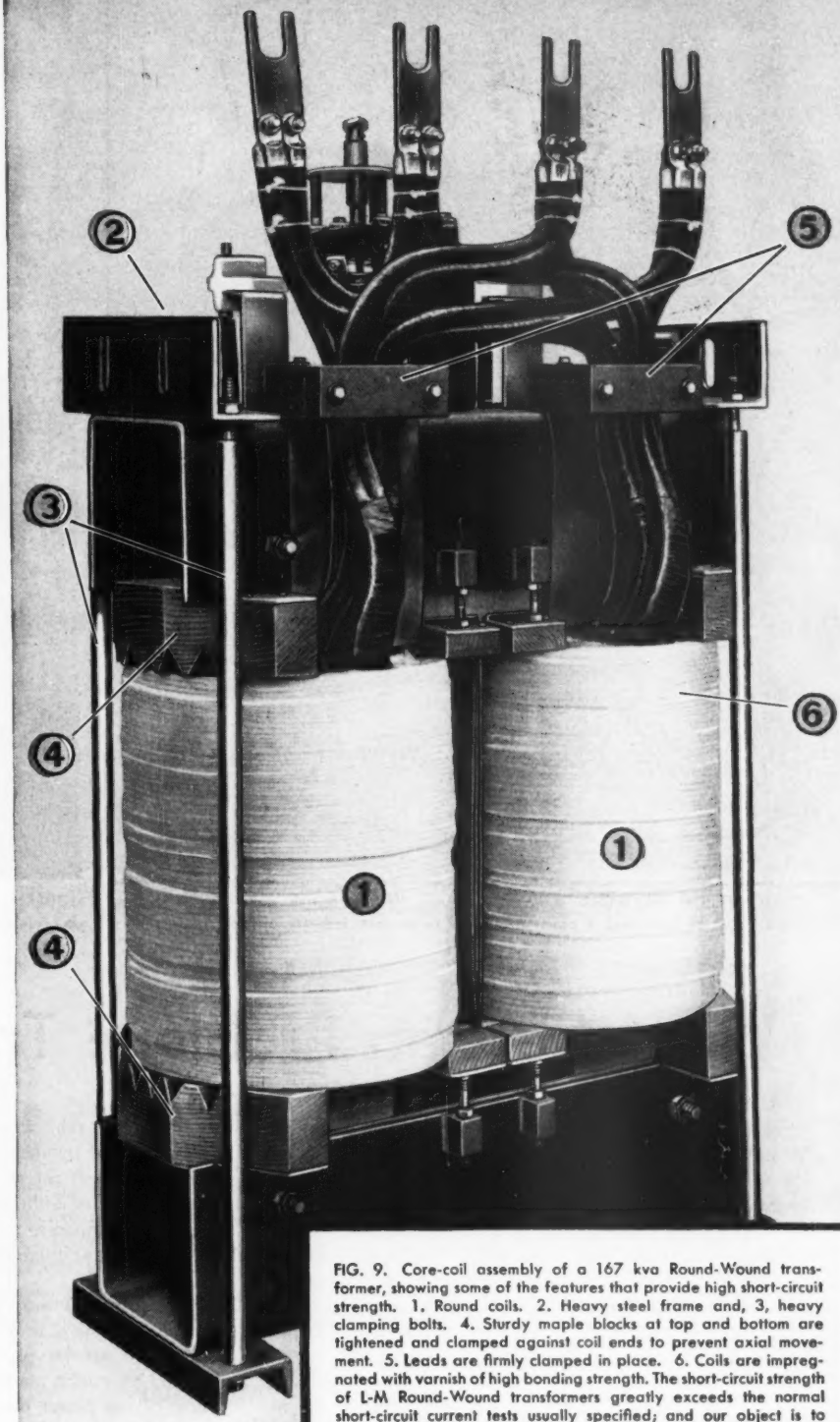
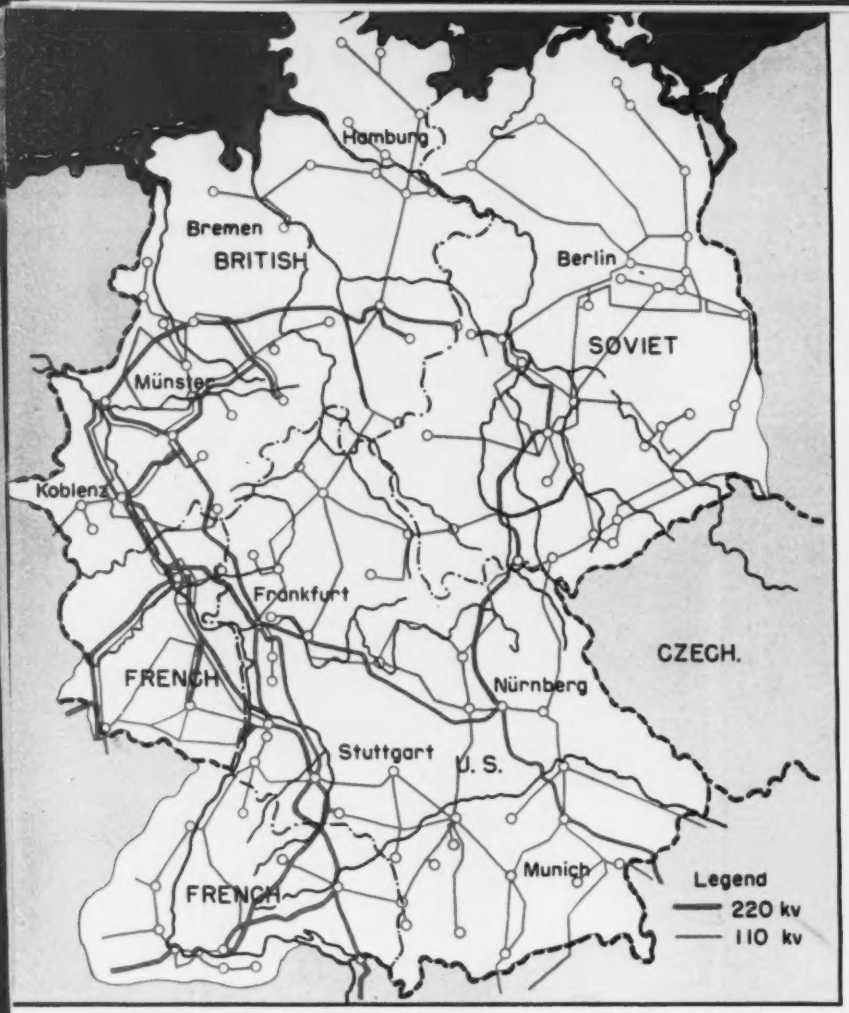


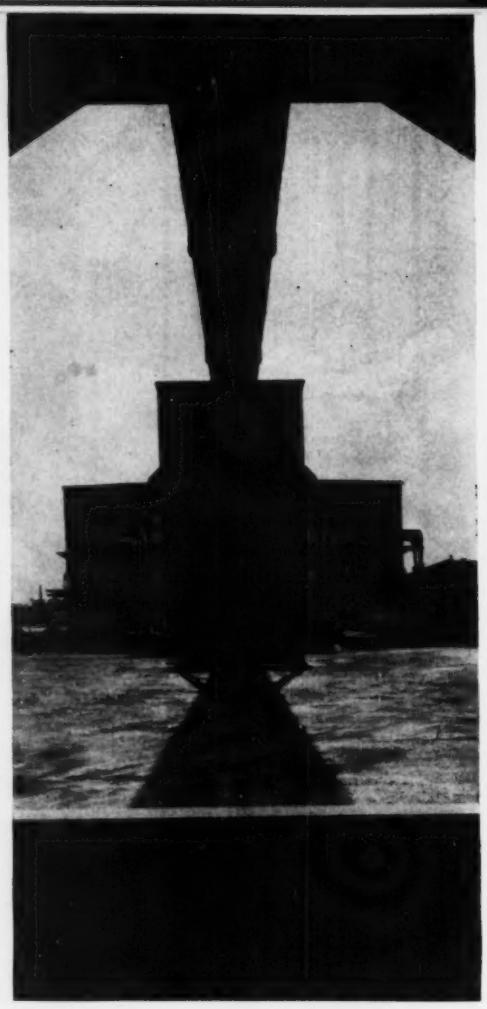
FIG. 9. Core-coil assembly of a 167 kva Round-Wound transformer, showing some of the features that provide high short-circuit strength. 1. Round coils. 2. Heavy steel frame and, 3, heavy clamping bolts. 4. Sturdy maple blocks at top and bottom are tightened and clamped against coil ends to prevent axial movement. 5. Leads are firmly clamped in place. 6. Coils are impregnated with varnish of high bonding strength. The short-circuit strength of L-M Round-Wound transformers greatly exceeds the normal short-circuit current tests usually specified; and our object is to build transformers that will withstand *dead* short-circuit currents.

Get Complete Information About L-M Round-Wound Transformers

We'd appreciate an opportunity to give you full information about the many desirable characteristics of these outstanding transformers. We'd like you to compare them with others—"Compare the things that count!" Ask the L-M Field Engineer for information; or write for new Bulletin DT-1 to Line Material Co., Transformer Div., Zanesville, Ohio (a McGraw Electric Company Division).



TRANSMISSION NETWORK in West Germany (U. S., British and French Sectors, above) must be expanded if power needs are to be met, industry officials there report



MODERN DESIGN went into construction of coal-handling equipment of new Harburg plant

West German Problem: Transmission

FRANKFURT (McGraw-Hill World News)—Although West Germany's installed capacity rose from 10,092,000 kw in 1948 to about 13,500,000 kw in 1952, and the country's gross power production from 32.6 billion kwhr to 56.2 billion kwhr in the same period, the Union of German Electricity Supply Companies estimates that investments totalling 1.3 billion Deutsche-marks a year will have to be spent to catch up with the accumulated post-war recovery needs both in the field of public and industrial power supply.

During the past few years, the greater share of available capital was spent on additional power generation at the expense of distribution and transmission systems. These systems are now held in need of urgent extension.

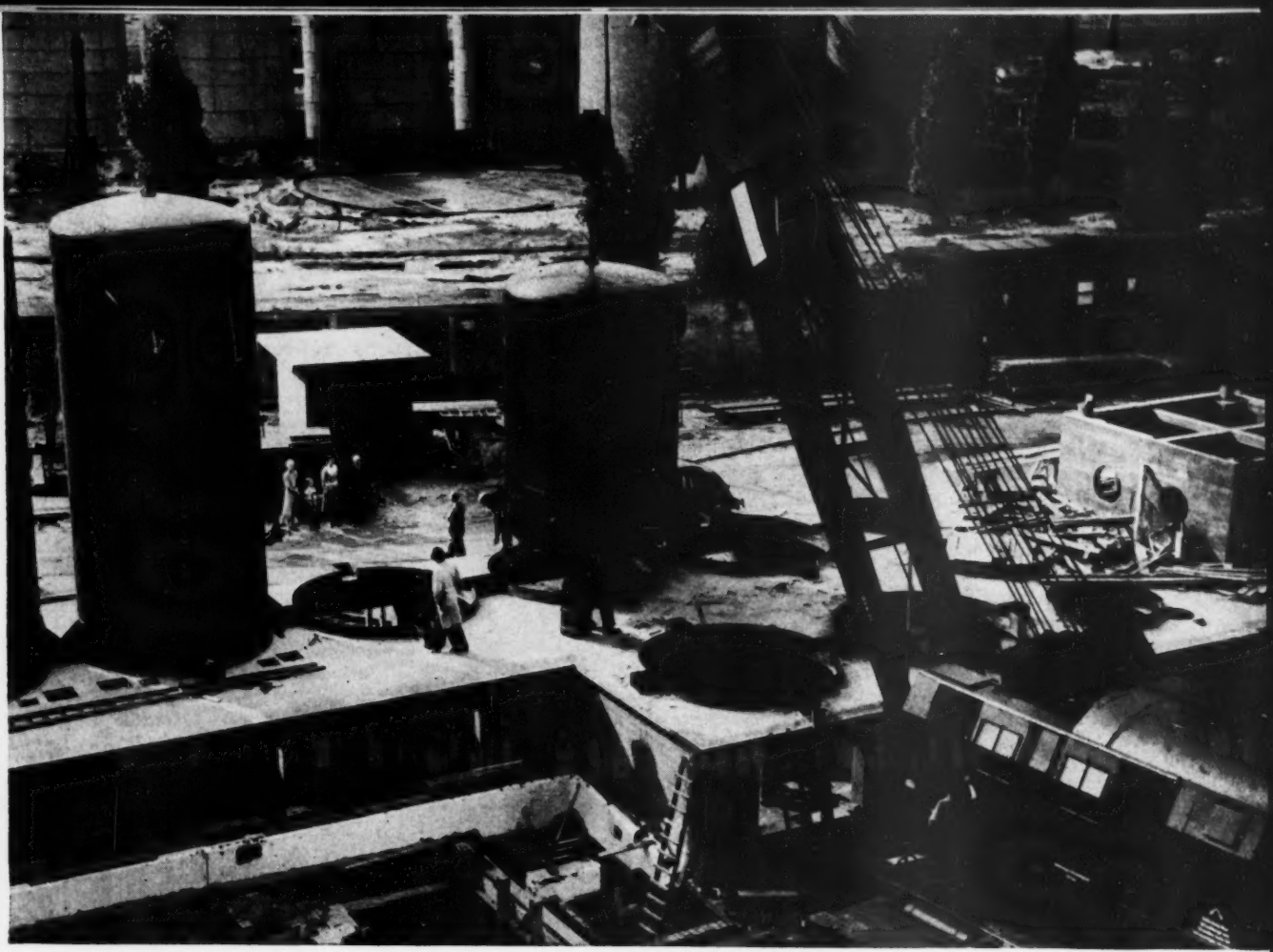
Although physical assets of the German power system are held to be in good shape, industry officials feel that further maintenance and extension are seriously handicapped by the present writing-off possibilities. The industry feels that this deficiency must be remedied by changing present methods of taxation. A step in this direction was taken last year when the so-called Investments Aid Bill was passed by the German Parliament which grants special writing-off rates.

Publicly owned utilities in Germany are taxed much as are private companies and are subject to much the same laws governing writing off of plants.

Much Industrial Power . . . About 40% of the entire power consumption in West Germany is now being produced by industrial plants, with the other 60% being generated by public plants.

Most of the power produced by industry is for its own consumption. In 1952, industry supplied only 4.4 billion kwhr for the public net, while public power plants generated and distributed 34.3 billion kwhr. At the present time, about 4,000 electric supply companies produce as well as distribute in West Germany. Individual output varies from several billion kwhr to a few thousand kwhr in the case of the smaller companies.

At the moment, power for the public supply net in



HARBURG PLANT of the Hamburg power system is one of newer installations in West Germany. Supply is not short, but additional distribution facilities are badly needed. Picture shows gravel and exchange-of-bases filters being assembled at the plant is completed

and Taxes

West Germany is based on hard coal by 50% on lignite by 25%, and on hydro resources by 25%. The number of power plants using lignite, however, is increasing and may change these percentages within the next few years.

New power stations now under construction include a hard coal power plant with an installed capacity of 67,000 kw at Aschaffenburg (Northern Bavaria), and a hydro, run-of-river station at Braunau-Simbach, with an installed capacity of 96,000 kw. Other major installations now in operation are:

Location	Installed Capacity
Brown Coal	
Goldenberg-Werk (near Cologne)	750,000 kw
Fortuna (near Cologne)	410,000 kw
Borken (near Kassel)	182,000 kw
Schwandorf (Lower Bavaria)	88,000 kw
Frimmersdorf (near Aachen)	300,000 kw

(First 100,000 kw unit is now being constructed.)

(*Continued on page* 24)

IRON CURTAIN, in this case the Elbe River, forms backdrop for 140 Mw East Hanover Plant. West Zone exchanges power with East

West German Problem

(*Continued from page* 23)

Hard Coal

Marbach (near Stuttgart)	200,000 kw
Gustav-Knepper (near Mengede/Westphalia (low-grade coal)	100,000 kw

Hydro, run-of-river Stations

Jochenstein (Danube river "border" plant)	95,000 kw
Altheim	20,000 kw
Nieder-Aichbach (on the Isar River)	20,000 kw

A hydro-storage reservoir plant with an installed capacity of 45,000 kw is also being constructed at Rosshaupten on the Lech river.

Orthodox Power . . . At present, German industry does not appear interested in wind generation or the use of thermal hot springs. The use of atomic energy for industrial power is, of course, non-existent because Germany is not allowed to have her own atomic energy installations.

Extensive international power exchange arrangements exist with several other European nations. Germany exports as well as imports power from Austria, Switzerland, France, the Saar, Belgium, Holland, and Denmark. An upward trend can now be observed in the exchange of power with these nations.

About 151 million kwhr are imported from the Soviet Zone of Germany, while 42 million kwhrs are exported to that zone.

Efficiency of German power plants rose to some extent between 1948 and 1952 through installation of new machinery. In 1948, the hard coal consumption averaged 0.7 kg/kwhr and dropped to 0.54 kg/kwhr in 1952. Further increases in efficiency are to be expected to come about with the increase in the installation of modern equipment.

Austria Is Constructing 220-Kv Line to Serve Italy

VIENNA, (McGraw-Hill World News)—A 220-kv power line is at present under construction to connect the Austrian high-voltage net at Lienz (East-Tyrol) with the Italian high-voltage net near Pelos (Northern Italy). The new line is to transfer an annual quota of about 80 million kwhr to Italy, but only if the World Bank grants the requested 400 million schilling credit to Austria, to build the storage group of the Reisseck power works.

The presently used line is only 110-kv.

Both lines serve to fulfill the Austrian exports of energy. The credit requested from the World Bank for the Reisseck power works depends on the Italian agreement to buy annually at least 100 million kwhr. With the foreign currency earned, Austria will be able to pay back the World Bank loan.

AEC's Industrial Reactor Program: A Roll Call

In May 1951 the Atomic Energy Commission authorized four industrial teams to make feasibility studies on the use of nuclear power for industrial purposes. Since then interest has grown to the point where a total of 54 firms and organizations now are studying development of power reactors and related problems.

At EW's request, AEC's Industrial Power Branch has compiled the following list of organizations taking part in the program. Items concerning the addition of other utilities will be published as AEC lists their names.

Industry Teams and Their Associates

BECHTEL CORP—PACIFIC GAS & ELECTRIC CO

COMMONWEALTH EDISON CO—PUBLIC SERVICE DIVISION OF NORTHERN ILLINOIS

Associate:
- Sargent & Lundy

DOW CHEMICAL CO—DETROIT EDISON CO

Associates:
- Babcock & Wilcox Co
- Nuclear Development Associates, Inc
- Cincinnati Gas & Electric Co
- Cleveland Electric Illuminating Co
- Consolidated Edison Co of New York
- Consumers Power Co
- General Public Utilities Corp
- New England Electric System
- Philadelphia Electric Co
- Public Service Electric & Gas Co of New Jersey
- Toledo Edison Co
- Vitro Corp of America
- Wisconsin Electric Power Co
- Consolidated Gas, Electric Light & Power Co of Baltimore
- Hartford Electric Light Co
- Niagara Mohawk Power Corp
- Potomac Electric Power Co
- Rochester Gas & Electric Corp
- The Southern Co
- Allis-Chalmers Manufacturing Co
- Bendix Aviation Corp
- Ford Motor Co
- United Engineers & Constructors, Inc
- Atlantic City Electric Co
- Gibbs & Cox, Inc

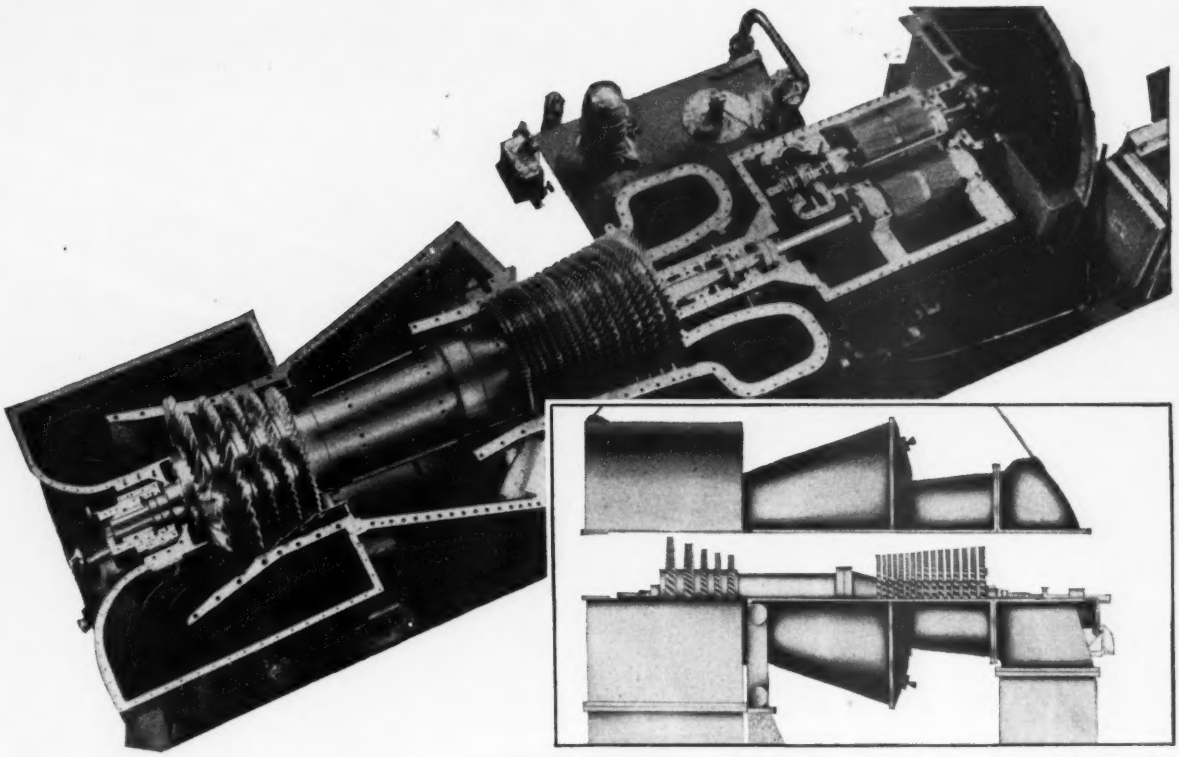
MONSANTO CHEMICAL CO—UNION ELECTRIC CO OF MISSOURI

PIONEER SERVICE & ENGINEERING CO—FOSTER WHEELER CORP

Supporting companies:
- California-Oregon Power Co
- Louisville Gas & Electric Co
- Northern States Power Co
- Oklahoma Gas & Electric Co
- San Diego Gas & Electric Co
- Wisconsin Public Service Corp

Others Who Have Expressed an Interest

- Duquesne Light Co
- Walter Kidde Nuclear Laboratories, Inc
- General Electric Co
- North American Aviation
- North Carolina State College
- University of Michigan
- South Carolina Electric & Gas Co
- Kuljian Corp
- Fairbanks, Morse & Co
- American Machine & Foundry Co
- National Association of Railroad and Utility Commissioners



Main illustration shows how center line split makes complete turbine easily accessible. Flanges for separate bearing covers can be seen at either end of rotor shaft. Easy casing removal using overhead hoist is demonstrated in side view above.

WESTINGHOUSE 5000-KW GAS TURBINES . . .

Split down the center line . . . to save inspection time, ease maintenance

The entire turbine and compressor on this Westinghouse Gas Turbine are exposed by just lifting one single casing. Inspections are quickly made using light lifting equipment in readily available overhead space—hazardous manhandling and rigging at floor level being kept to a minimum. Lifting is logical, too, because it follows long-established electric utility practice . . . is the most *expeditious* way to open any turbine. Westinghouse also uses split bearing casings to ease maintenance. With no bearings buried inside, each end bearing has its own separate cover plate. This *end* bearing construction also eliminates hot seals and special bearing cooling. It's an important maintenance time saver.

These and such other features such as easily removed radial combustors and no high-pressure internal air or gas seals recommend the Westinghouse 5000-kw Gas Turbine for electric power generation. Use it for base load where fuel is cheap; for reliable peak, stand-by and end-of-line loads; for locations where water is scarce or expensive, or where mobile or semi-mobile plants are required. Let experienced Westinghouse Power Plant Engineers help solve your generation problems with one of the above applications. Get the complete story from your local Westinghouse office or by writing Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-50563

YOU CAN BE SURE...IF IT'S

Westinghouse

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Helping the industry meet its growing loads

Thermalastic... insulation with a memory*

Thermalastic insulation is the latest magic of industrial chemistry to achieve practical application in large motors and generators. Heat it . . . cool it . . . cycle it again, Thermalastic remembers the copper to which it is applied and stays with it. Stretching does not affect its properties and it will always return exactly to its original shape.

The scope of this development challenges the imagination. Thermalastic insulation offers the industry new freedom from shutdowns caused by insulation failure.

Most insulating materials in common use today are considered excellent. But imagine the inherent protection, the vastly improved reliability, in equipment having Thermalastic insulation . . . with its superior thermal stability, outstanding moisture resistance and inertness to chemical contamination and dirt! The high voltage endurance of Thermalastic increases "time to failure" many hundred fold.

The basic materials in Thermalastic insulation are well known, their characteristics proved. The contribution of chemistry has been the development of a synthetic resin that contains the same elements as natural resin with an important molecular change. That, plus a new application technique, produces distinctive qualities that utilize fully the high insulating value of large mica flakes, and maintains them throughout the endless heat cycling that windings must endure. Thermalastic insulation will always hug its copper. It will never migrate or become brittle with age.

Evolved in the minds of engineers, developed in the laboratory, made practical on the production line, Thermalastic insulation is an outstanding example of the progress that Westinghouse offers to help you meet America's power needs.

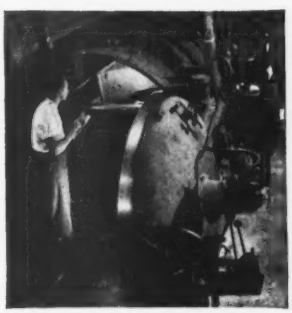
*Trade-Mark J-97176

YOU CAN BE SURE... IF IT'S Westinghouse

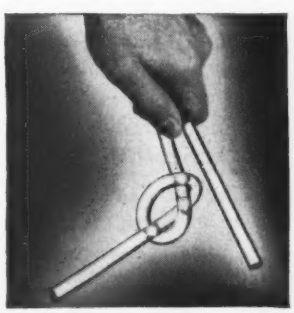
Thermalastic insulation

A chemist's skill at synthesizing, plus an application technique, adds wonderful new qualities to time-proved insulating materials.

Large mica flakes are built into a resilient, flexible tape that can be wound in smooth layers, providing the highest insulating qualities known.



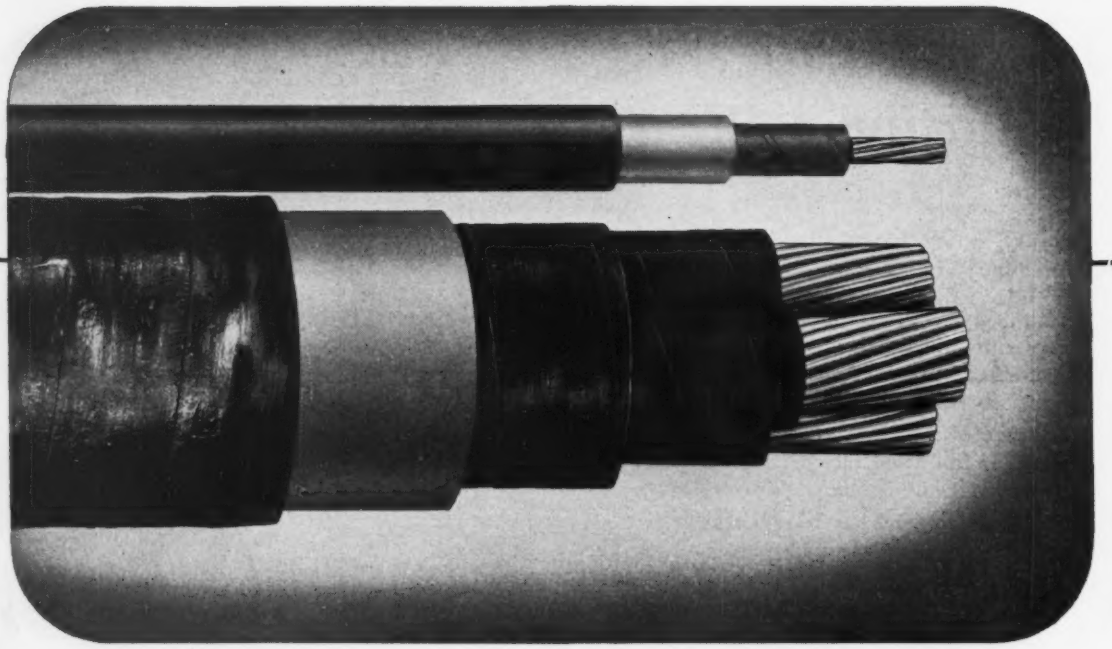
The synthesized resin, having low viscosity, can be made to penetrate the mica completely, leaving no voids between layers, or between mica and copper. Thermosetting, it creates no voids, will not melt.



Infinitely elastic, chemically inert, the resin will hold the mica tight to its copper regardless of heat cycling or overload. Unaffected by moisture, it will never become brittle with age.

ROEBLING PROTECTIVE COVERINGS ON LEAD SHEATHED CABLE

for utilities, chemical plants and the petroleum industry



LEAD SHEATHED CABLES used in certain applications by public and private utilities, chemical plants and the petroleum industry are often impaired by electrolysis or chemical corrosion. But such corrosive action can be effectively reduced, and cable life extended, by using Roebling Paper Insulated and Varnished Cambric Cables with either of two outer protective coverings.

One of these coverings is an extruded thermoplastic sheath employing a special high-molecular weight polyethylene. The other is ROESHEATH, built up of neoprene and neoprene-filled fabric tapes and vulcanized directly over the lead sheath. Both coverings not only provide essential protection, but, in some cases, may permit the thickness of the lead sheath to be reduced.

For longer, more dependable cable life and worthwhile economy write for full information... and get our recommendations for solving any special problem.

John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

A subsidiary of The Colorado Fuel and Iron Corporation

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CF&I

JAR ROEBLING

Vennard Elected President . . .

. . . of Middle West Service Co to succeed K. D. Carpenter. R. McClanahan is elevated to post of Executive VP

EDWIN VENNARD

Edwin Vennard has been elected president of Middle West Service Co, Chicago, to replace K. D. Carpenter, who has resigned. R. McClanahan was appointed executive vice president.

Prior to his election as president, Vennard was vice president of Middle West Service. He has been a member of the firm since its organization in the middle 30's, serving as a consultant on rates, economics, new business, public and employee relations and advertising. He will continue as a member of the board of directors and the executive committee.

R. McCLANAHAN

McClanahan has been affiliated with Middle West Service since its organization except for eight years during which he served as vice president of United Public Utilities Corp. Since 1950 he has been a vice president of the Chicago service firm and a member of its board of directors and executive committee.

•

W. M. Large, assistant to Operations Vice Pres F. D. Danielson of Public Service Co of Indiana, Inc, has been designated manager of the Western Division to succeed **K. F. Dickinson,** who will retire at the end of the year. **John Ave** will assume Large's former duties. **F. M. Hartman,** Wabash district manager will become Terre Haute district manager to replace **William D. Wallace,** who also will retire in December. **J. M. Agnew** will fill Hartman's former post.

R. E. McCleary has been elevated from assistant superintendent of production for Pennsylvania Electric Co's system to superintendent of the utility's Shawville generating station, now under construction near Clearfield, Pa.

L. J. Fitzpatrick has been appointed assistant to the general manager of Westinghouse Electric Corp's Lamp Division at Bloomfield, N. J. Prior to this new assignment, Fitzpatrick was assistant to the manager of the firm's Television-Radio Division. He has been a Westinghouse employee since 1942.

David H. Gerhard, Saginaw (Mich.) Division manager for Consumers Power Co, has been made manager of the Southeast Division at Pontiac, Mich. **Donald B. MacDonald,** assistant division manager at Saginaw, replaces Gerhard there.

Dr Cecil B. Ellis, a former co-ordinator of the Nuclear Aircraft Project at Oak Ridge National Laboratory, has been named head of the research department in the Laboratory Division of Walter Kidde Nuclear Laboratories, Garden City, L. I., N. Y. Other new department heads include **J. J. Byrnes,** engineering department, Laboratory Division; and **Karl Puechl,** theoretical department, Development Division. Byrnes has been identified with the atomic energy field since 1943 and Puechl has been for some time a member of the department he now heads.

J. Kenneth Salisbury, engineer in charge of thermal power system development for General Electric Co, has accepted an appointment effective Sept. 1 as professor of mechanical engineering at Stanford University, Palo Alto, Calif.

CHARLES A. MACFIE

Revere Copper & Brass Elects Macfie President

Revere Copper & Brass, Inc, has elected Charles A. Macfie president to succeed James M. Kennedy, who was appointed board chairman and chief executive replacing the late James J. Russell (EW, Aug. 24 p 236). Macfie formerly was vice president and general sales manager of all rolling mill sales.

The company also announced the election of Robert M. Lake as vice president in charge of the Rome Division. Lake, who has been sales manager of the division since 1950, will replace Raymond P. Winberg, Revere's new general sales manager. Winberg will now make his headquarters in the company's executive offices in New York.

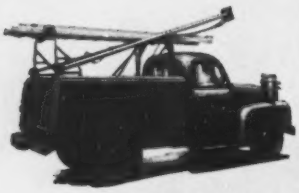
UTILITY WORKHORSE-

LINE CONSTRUCTION BODY (500)
Medium and heavy duty work. Vertical compartments are optional . . . can be equipped to fit individual needs.

FOR LONG LIFE AND TROUBLE FREE SERVICE

All *Powers-American* bodies have *earned* the reputation of "workhorse" of the utility industry by years of faithful performance. No matter how tough the job or the operating conditions, they pull more than their share of the load by stepping up crew efficiency and lowering operating costs. Whatever your utility body needs, *Powers-American* is your *1* source for *all types* of utility bodies and equipment. Write today for more information. Put a *Powers-American* "workhorse" on your job and watch the team pull ahead!

REVOLVING AERIAL LADDER
Models available in working heights of 23' 6", 26' 6", 30' 6", and 32' 6" for all styles of bodies.



LIGHT DUTY MAINTENANCE BODY (350)
Fold-over type derrick will handle poles up to 40' in length. 24' ladder extends from rear of body.

HYDRAULIC TOWER
Available in sizes from 21' to 30'. Platform revolves full 360°. Tower can be operated from cab or platform.

"The Accepted Standard with Utilities Everywhere"

LINE CONSTRUCTION BODY (600)
Completely equipped to carry all tools and materials needed for line work. Can be furnished with winch and derrick, compressor, digger, or any special equipment required . . . for use in any phase of the utility industry. Available in 9' to 14' lengths, with or without built-in crew compartment.

There are many styles of *Powers-American* Bodies not shown here. Write for descriptive catalog today.

POWERS *American* DIVISION
AGB

PUBLIC UTILITY BODIES AND EQUIPMENT

McCABE-POWERS AUTO BODY COMPANY
3201 North Broadway • St. Louis 15, Missouri

Maillard President of IAEL

League's new head is top official and managing director of the Electric League of Indianapolis

ALBERT L. MAILLARD

Albert L. Maillard, president and managing director of the Electric League of Indianapolis has been named new president of the International Association of Electric Leagues.

Other new officers of IAEL include H. E. Cook, Electrical Association of Detroit, vice president; E. J. McGinnis, Cincinnati Electrical Association, treasurer; and A. H. Kessler, North Central Electrical Industries, Minneapolis, secretary.

Consulting Engineer . . . Following graduation from Catholic University of America, Washington, D. C., Maillard was a member of that university's faculty serving in the electrical engineering department. After several years of private practice as a consulting engineer in electrical and mechanical work, he went to Kansas City Power & Light Co, which he served for 13 years.

While with Kansas City P&L, he worked as a consultant to the power sales department, director of the personnel and public relations department, and supervised the air-conditioning department. Before accepting the league post, he worked for Jayhawk Works, Kansas chemical plant.

Peterson Is Appointed a VP

A. W. PETERSON

A. W. Peterson has been appointed a vice president of Central Vermont Public Service Corp and manager of the company's business and properties in the area of northwestern Vermont that was served by Public Electric Light Co before the merger of the two utilities in July. He was president of Public Electric Light prior to the merger.

Peterson started his utility career in 1907 when he was named general superintendent of the Vermont Power & Manufacturing Co, which became Public Electric Light in 1915. He was elected a director of the utility in 1924 and became president in 1949.

•

C. Duncan Brainard, assistant manager of the Chicopee (Mass.) Electric Light Department, has been promoted to manager to succeed **Roy P. Benedict,** who has retired.

William H. Till, district manager at Walla Walla (Wash.) for Pacific Power & Light Co, Portland, Ore., since 1939, has been named special representative for the company. Till, who joined the utility in 1919, will continue in an advisory capacity in the district while **Homer Beale,** manager of the Pendleton (Ore.) district, takes over active management at Walla Walla. **Thomas M. Keenan,** Yakima (Wash.) district line superintendent, will succeed Beale at Pendleton (Wash.).

Hoffman S. Beagle, manager of the Heating Products Division of Miller Co, Meriden, Conn., since 1947, is leaving the firm Sept. 1 to become associated with Electrical Testing Laboratories, Inc, New York, as assistant to the president. He joined Miller 15 years ago.

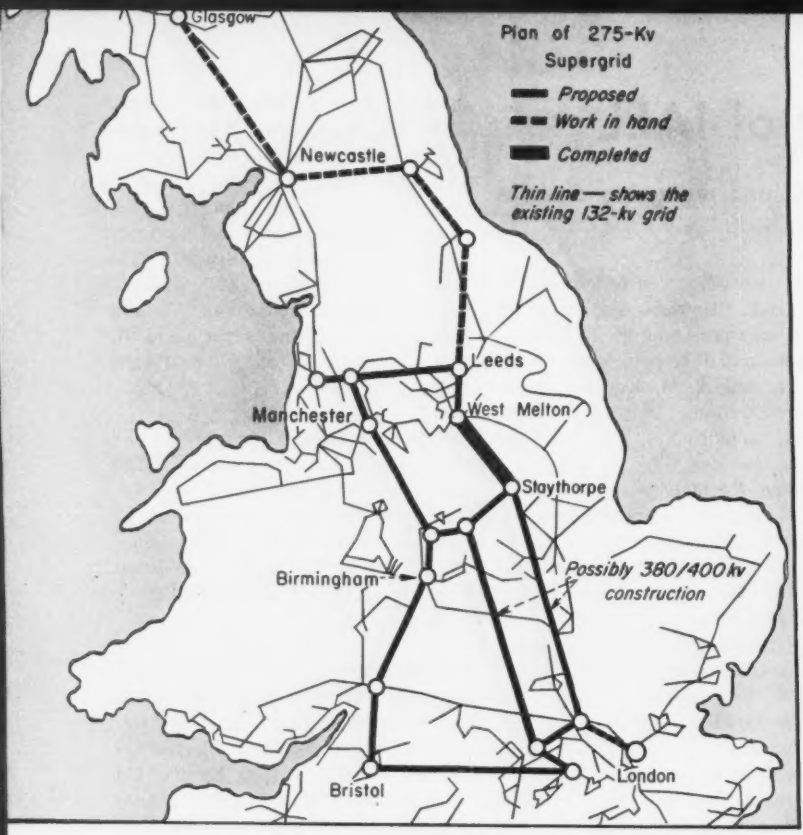
Robert Harrington has joined Orangeburg Manufacturing Co, Inc, as director of new products development. For the past seven years, Harrington has served with General Electric Co as an engineer specializing in insulation and plastic materials and processes for new products and applications.

E. L. Gochnauer, power superintendent, will become project superintendent for Hungry Horse Dam upon completion of the project construction. **Marcus Hilden,** present acting office engineer, will become assistant superintendent and **Ed Rognas,** supply officer, will be administrative officer. **Richard Greiner** will continue as head of maintenance and **Charles Simmons** will continue as head of power house operation.

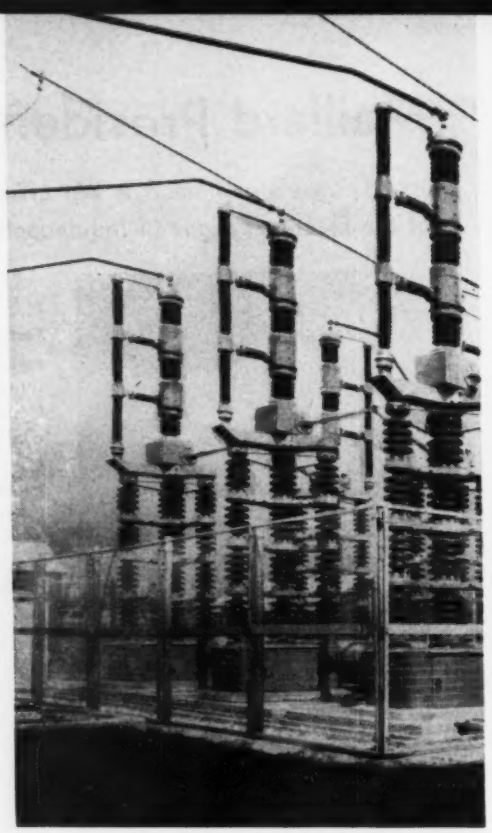
OBITUARY

Frank J. Haas, 76, former vice president and general manager of Southern Indiana Gas & Electric Co, died at Evansville, Ind, Aug. 14. Haas, who joined the utility in 1908, relinquished his executive duties with Southern Indiana in 1934.

Byron T. Story, 71, retired official of Southern California Edison Co, died Aug. 12. Associated with the utility for almost 45 years, Story served as treasurer from 1930 until his retirement in 1948.



BRITISH GRID MAP shows the location of the first stretch of proposed 275-kv grid



AIR BLAST BREAKER at West Melton Substation of British

Britain Inaugurates 275-Kv Supergrid

First section of new network will provide experience under Britain's peculiar climatic conditions. Cheaper energy and more efficient use of coal are long range goals

J. H. M. SYKES

The first link of Britain's new 275-kv super grid is now alive. Technical details have been revealed on the 42-mile, semi-experimental section running from Staythorpe, Nottinghamshire, to West Melton, Yorkshire, which went into 275-kv operation on July 15.

Main function of the new line will be that of an interconnector rather than a bulk transmission channel. It now links a power station in the East Midlands coalfields with a marshalling point for power stations in the Yorkshire coalfield. This arrangement is part of a plan to site Britain's new power plants nearer to the main source of power production—the Midlands coalfields.

By 1960 the super-grid will stretch over 1,200 miles to link load-consuming areas in the North and South with new large scale generating plants now building in the Midlands, East Midlands, and Lancashire. Hydropower sources in Scotland also will be tied into the system.

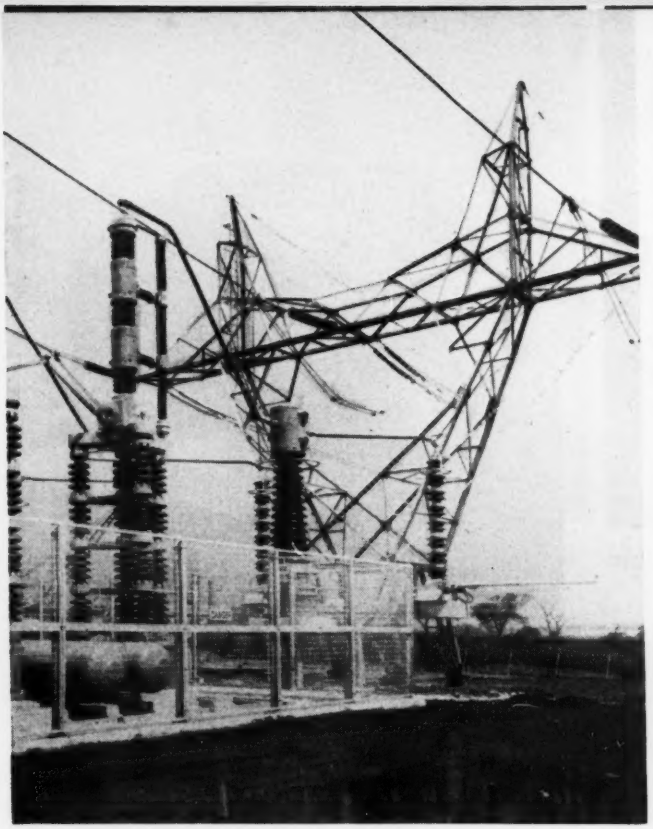
Transmission on the first section of the super-grid is by a single circuit twin 0.75-sq in. section (copper equivalent) overhead line with a thermal capacity of 375 Mva. Autotransformer capacity at each end of the section imposes a limit of 120 Mva, so the remainder of the network will continue to operate at 132 kv.

Meanwhile, plans call for the only double circuit construction for 275 kv yet developed by any utility in any part of the world. One double circuit section will run 114 miles between Staythorpe and Elstree. A second section will extend 63 miles from Drakelow (Burton-on-Trent) to Carrington (Manchester), while a third will be a 62-mile link between Stella (Newcastle) and Thirsk.

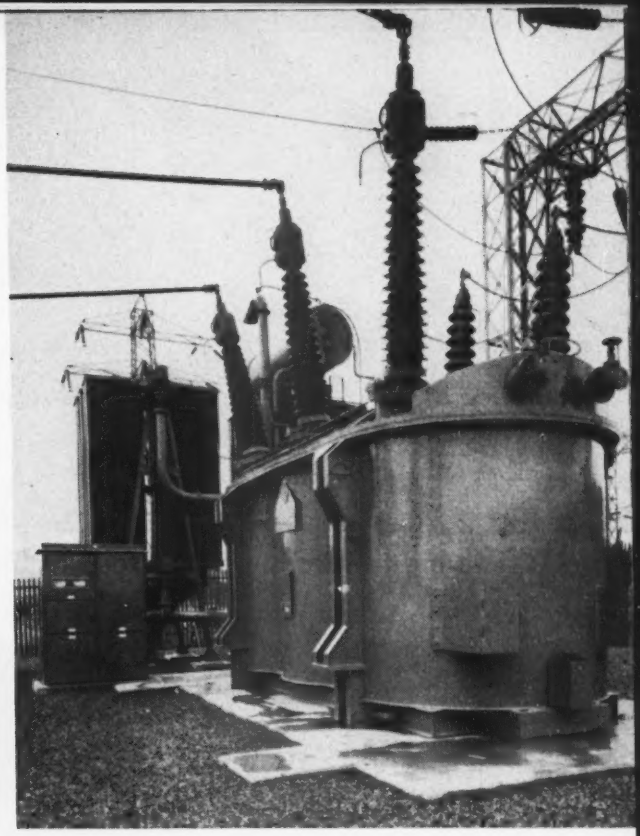
Double circuit tower lines will be of two types:

- A high-tensile steel lattice structure rising over 115 ft. Basic span will be 1,000 ft with twin 0.175-sq in. conductors per phase and a minimum of 22 ft between phase conductors.
- An alternative design over 136 ft high that will be suitable for twin 0.4 sq in. conductors. Clearances will be great enough to permit future operation at 380 kv. This tower is intended for sections from the Midlands to the south of England that will be devoted entirely to bulk transmission. Thermal capacity will be 570 Mva.

Breaker Rated 7,500 Mva . . . At the West Melton end of the line now operating, service experience is being gathered on an English Electric 275-kv circuit breaker. It consists of three



Electric Authority has a rating of 275 kva, 7,500 Mva, 3 phase



AUTOTRANSFORMERS at West Melton have 120-Mva capacity

identical single-pole units that are coupled together both electrically and pneumatically. Each unit has six interrupters connected in series and mounted in two vertical columns.

The interrupters are of the axial blast pattern shunted by porcelain-clad non-linear resistances (or surge diverters). Each of the interrupter columns is carried on a supporting structure of porcelain insulators. An electrical connection between the columns is made by double make-switch blades. These are operated by air engines in the breaker mechanism housing.

Compressed air supply is fully automatic. Standard compressor units feed outdoor receivers which store the air at 600 psi. An automatic reducing valve drops the pressure to 300 psi as the air is fed through duplicate bus pipes to the circuit breaker control cabinets and to the breaker receivers.

Here are further technical data on the air blast breaker:

Symmetrical interrupting capacity	7,500 Mva
Symmetrical interrupting current	15.8 ka
Operating duty	B-3MB-3-MB
Normal working pressure	300 psi
Number of stored operations in local receiver	2 make-break

Transformers . . . The 3-phase, 120-Mva autotransformers have a voltage ratio of 275/132 kv. Anti-fog bushings are provided on both sides of the transformers. Later, larger transformers will be ordered, but British rail and road transport restrictions may cause abandonment of the 3-phase design.

To meet transport limitations, the English Electric transformer now used has a core of 5 legged construction. Its tank is shaped to follow the general outline of the windings. The entire transformer was carried to the site in the tank but without oil. It was estimated to weigh a total of 87 tons.

Statistics of West Melton—Staythorpe Line

Voltage	**275 kv**	**Length**	**40.5 miles**
Frequency	**50 cps**	**Normal rating per cct**	**375 Mva**

Structures

Material	Steel	Min, flashover (50 cyc)	650 kv
Aver no. per mile	4.7	Aver wght per structure	17,950 lb

Conductors

Type	ACSR. (twin)	Span (max)	1,500 ft
Size	0.77 sq in.	Sag final	39.9 ft at 122 F
Stranding	37/0.110 sq in.	Tension corres.	8,000 lb
Wght per ft	0.57016 lb	Type armor at clamps	None
Amperage design	800 (2 per phase)	Type vibration dampers	Stockbridge
Phase separation	32 ft	Line altitude range	200 to 800 ft

Max corona loss . . . 60 kw/3-ph mile under melting ice conditions.
Fine weather loss 3 kw/3-ph mile

Insulation

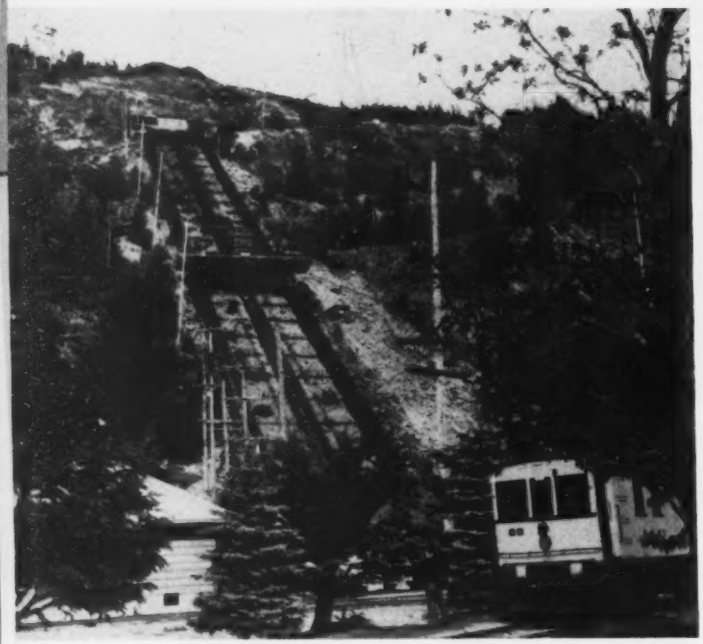
Basic imp insul level	1,050 kv	Tangent	Disk

No. units and kv rating 18 x 300

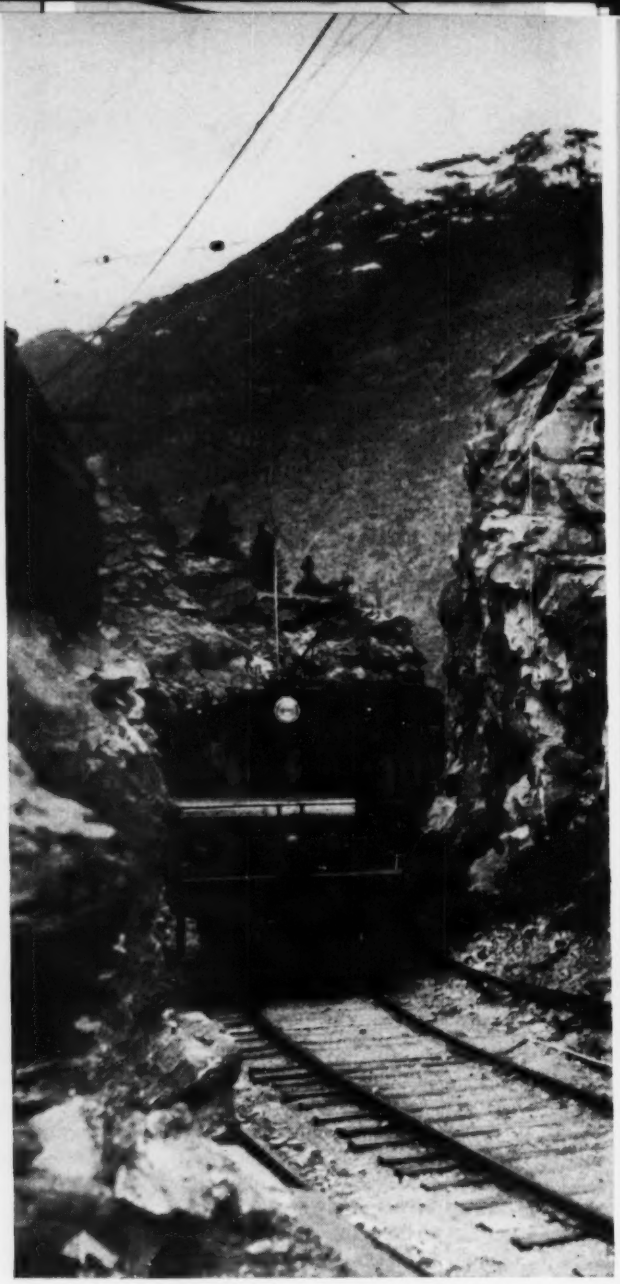
Impulse Surge Protection

No. of ground wires	2	Cone angle of prot	30 deg
Ground wire material	ACSR	Neutral grounding	solid

1. Two big transformers rode rails to Diablo



2 . . . then shuttled up hill on inclined railway.



3. Next came trip over rugged terrain

Seattle City Light Hauls Equipment Over

Getting equipment into its Skagit River power plants long has been a complicated problem for City Light of Seattle, Wash.

The municipal system had to build its own railroad up the Skagit River from Rockport to Newhalem and then to Diablo to equip its Gorge and Diablo plants.

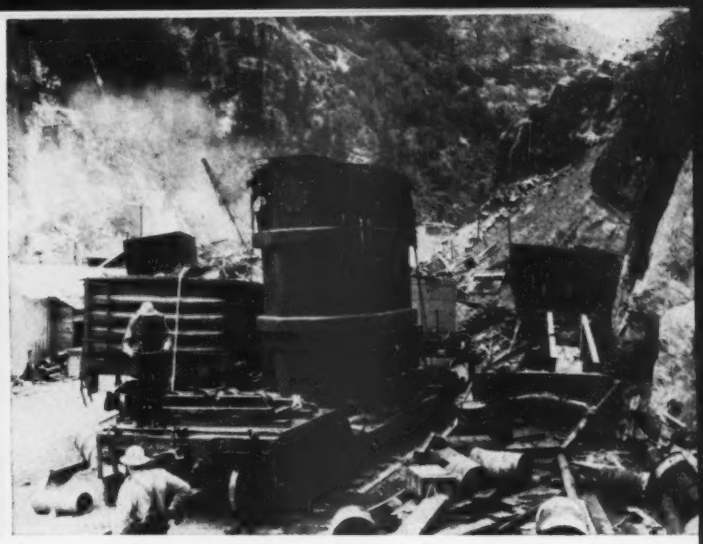
But the plant now being constructed at Ross Dam has presented even bigger headaches.

For this plant, equipment must traverse the railroad from Rockport to Diablo, an inclined railway with a 68° grade at Diablo, a short stretch of rail from the top of the incline to Ross Lake to the lake behind Diablo Dam, and 4½ miles of water to the base of Ross Dam.

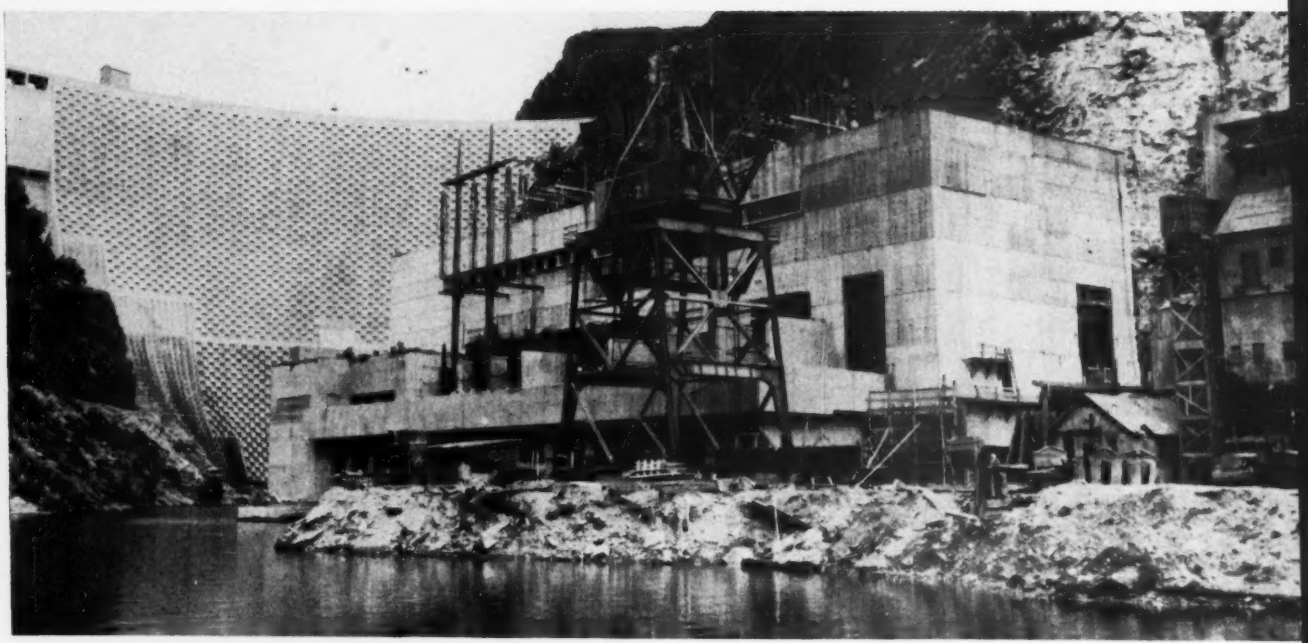
The Seattle City Light railroad recently carried its last big individual load.

It was the final two of six transformers for the Ross powerhouse. Each 70,000-kva, single-phase transformers measures 17½ x 12½ x 15

4 . . . to a lake for transfer to a barge.



5. Back on land, transformers hit tracks again



6 . . . before reaching destination—Ross Dam powerhouse—where they were installed.

a Rugged Course to Powerhouse

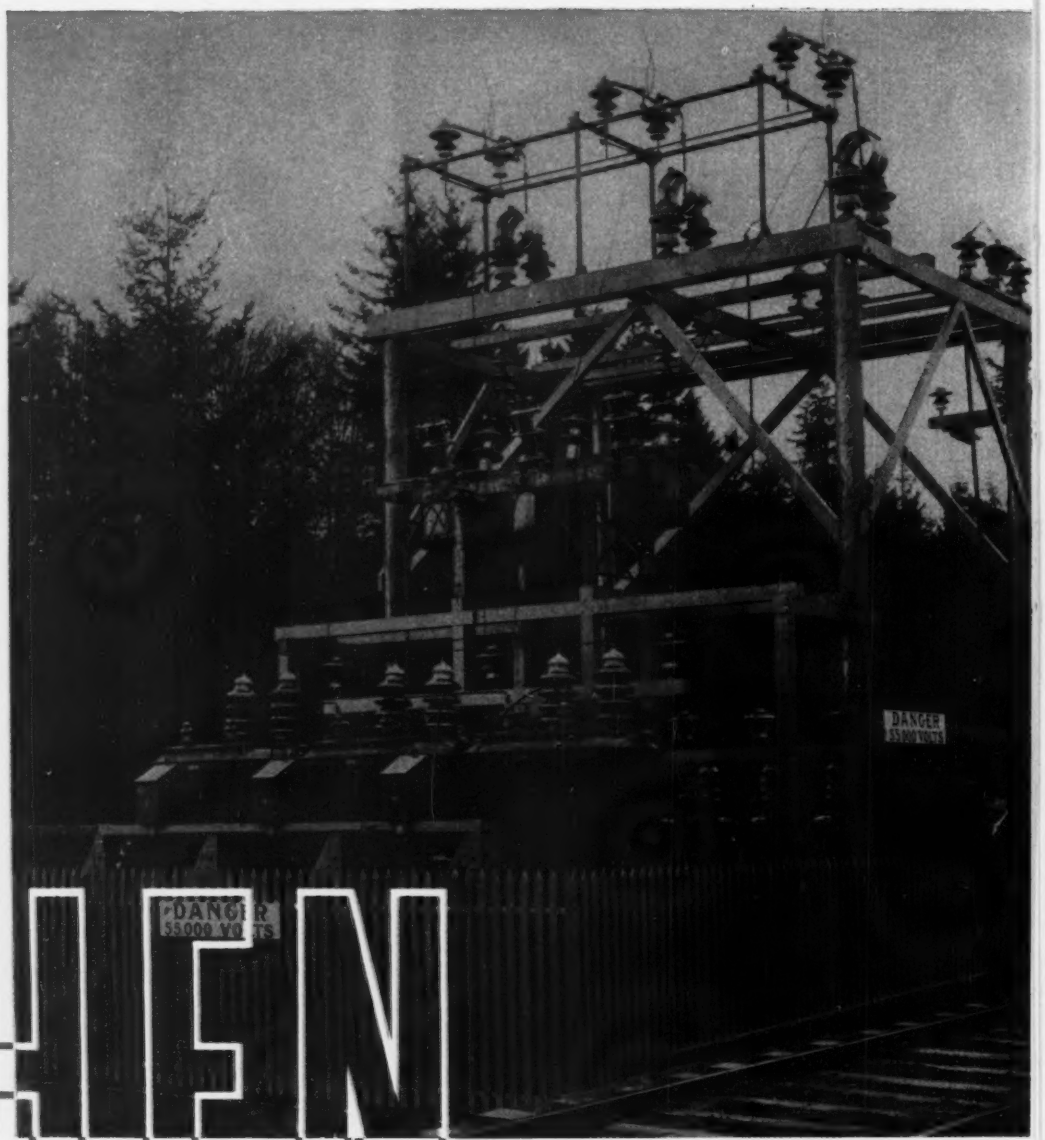
ft and weighs 62 tons. The route followed by these transformers after reaching Rockport via the Great Northern Railway from General Electric Co's plant in Pittsfield, Conn., is shown in the above series of pictures.

One of the big jobs in getting the transformers to Ross Dam was getting the load up the incline at Diablo on the railway. Eight tons had to be added to the counterweight to increase the carrying capacity of 158,000 lb sufficiently to accommodate each transformer and its 34-ton rail car.

The City Light railroad, which originally ran a distance of 24 miles from Rockport to Newhalem and then was extended 7.5 miles to Diablo, will be abandoned sometime during the next winter.

Newhalem now is served by a state highway while Diablo will be served by trucks operating over the old railroad roadbed. But beyond Diablo the route will continue the same.

MOLONEY POWER



THEN . . .

MOLONEY ELEC

Manufacturers of Power Transformers • Distribution Transformers • Load Ratio

FACTORIES AT ST. LOUIS 20, MISSOURI AND TORONTO,

TRANSFORMERS

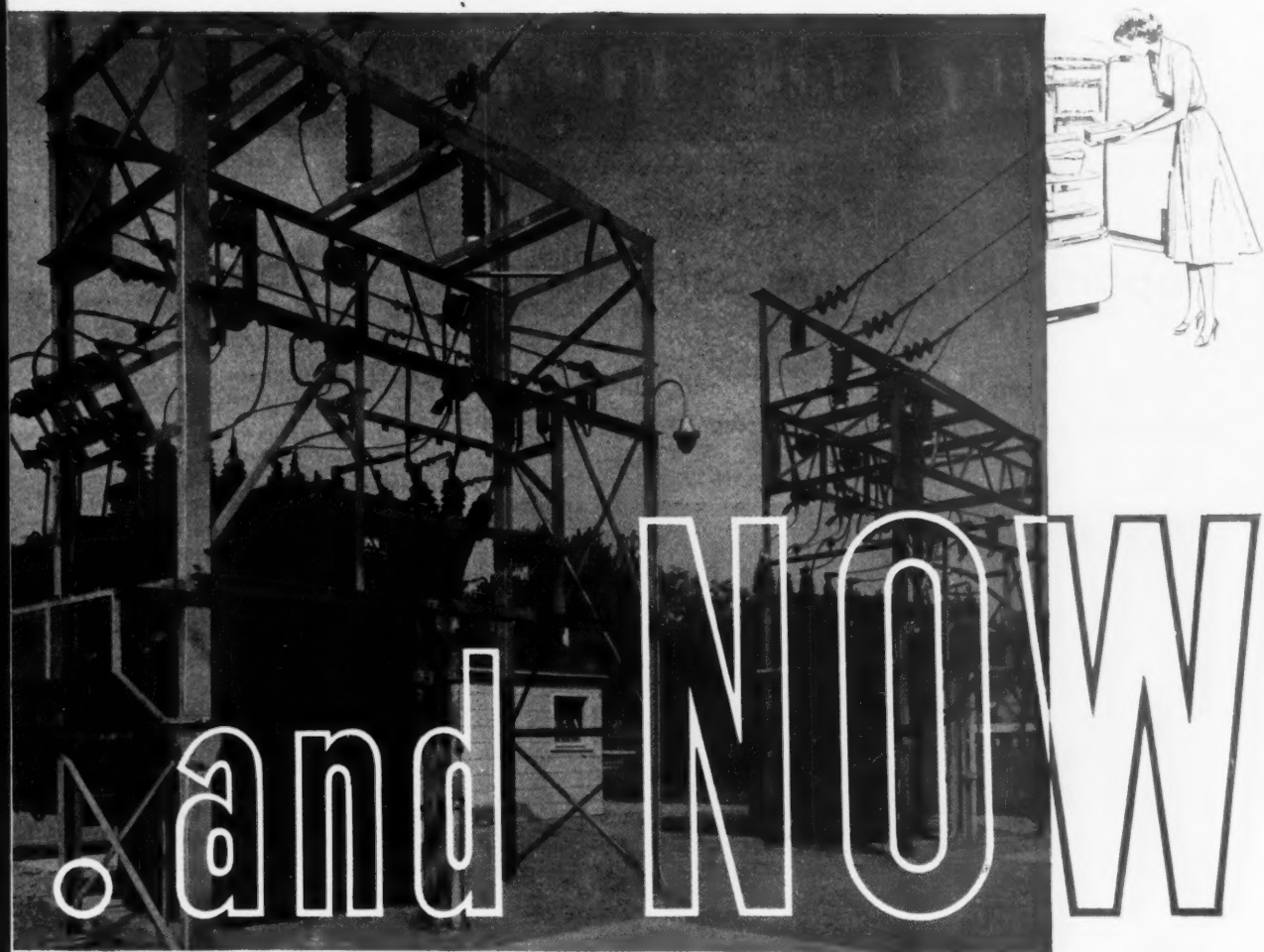
Back when the ice man was a familiar figure, those Moloney Transformers behind the neat picket fence were considered the best in design and dependability. Then, as now, the name Moloney meant "better performance." But, good as it was, that equipment would not begin to meet the utility needs of today. The multiplying demands for electricity make ever-increasing electrical capacity a "must" for utilities. And just as the modern home needs an electric refrigerator designed for today's living, electrical systems need transformers designed to meet today's demands.

Moloney Power Transformers with their built-in, proved superior, Load Ratio Control fit the present power picture. They are compact, dependable, and highly efficient and combine all the engineering, design and fabricating experience, which, with fine materials, produce transformers of the high standard upon which the company built its reputation.

Now, as utility engineers are designing systems of higher and higher capacity to serve their customers efficiently and economically, Moloney is prepared to provide transformers of any Kva or voltage rating required.

For over 57 years Moloney has been building better transformers which give better performance, have greater reliability, and require less maintenance. For further information contact your nearest Moloney Representative.

ME53-32



. . . and NOW

TRIC COMPANY

Control Transformers • Step Voltage Regulators • Unit Substations

ONTARIO, CANADA • SALES OFFICES IN ALL PRINCIPAL CITIES

ALMOST 14,000 persons moved through model home in 22-day campaign during which San Diego Gas & Electric Co was . . .

Pepping Up Home Sales Through Cooperation

Utility joins with manufacturers, and builder in light conditioned, adequately-wired display home

ALAN J. McCUTCHEON, Home Lighting Adviser, San Diego Gas & Electric Co

Joint planning among the power company, equipment manufacturers, and builder resulted in over one person a minute visiting the light-conditioned and adequately wired "Holiday Home" in San Diego, Calif. During the 22 days in which the model home sponsored by San Diego Gas & Electric Co was opened to the public, 13,662 people passed through.

Prior to this year, nearly any type of home would sell in the San Diego area. However, when the public showed signs of becoming more selective in choosing a home, San Diego G&E decided it was time to take action. Sponsorship of a $24,000, three-bedroom home was the move they chose.

First the company decided what appliances and equipment they would like to see in a home of this type. Manufacturers were contacted and all agreed to provide their products for the model home at no cost. After the area was selected, the company picked out an acceptable tract builder who had property there.

STICKERS pointed out electrical features, like the telephone outlet, and these wall switches that control lighting practically throughout home

Builder cooperates . . . Harmony Homes, Inc, of San Diego, accepted the company's offer. They gave a selection of ten floor plans to choose from and agreed to these terms:

- Wiring, lighting and heating to be according to company specifications.
- Furnishings and interior colors to be controlled by the company.
- Any feature in the model home would be available to purchasers of tract homes.

In return, San Diego G&E agreed to advertise and publicize the home; to keep a man in attendance at the home every day; and to coordinate action of all groups concerned.

Electrical features chosen by the company included a 90-amp breaker-type service box feeding 13 branch circuits, wall-to-wall fluorescent lighted valance in spare room (third bedroom) for television viewing or general room lighting, and lighting of entry-ways controlled from all adjacent doorways. Other load-building features included patio floodlighting controlled from living room, garage, and master bedroom, and three outdoor convenience outlets for use of lawnmowers, hedge clippers, exterior decoration lighting, etc. In all, there are 25 duplex convenience outlets in the house.

These features are among 53 described briefly in a booklet given to each person viewing the home. Each feature was identified by number in the booklet and by a circular card adjacent to the item in the home itself.

Private previews . . . Before the home was opened to the public, several private preview meetings were held. The first was a luncheon for 30 people representing groups interested in better housing for San Diego.

Second meeting was a dinner for 40 persons representing firms cooperating in the home and the press. Third preview was a morning meeting for directors of Bureau of Home Appliances of San Diego County.

Public opening was advertised by outdoor signs, in the paper, and on the radio and television. Formal opening was attended by 1,500 persons in nine hours, a typical number for the next 21 days. An average of 69 people per hour passed through the house between 1 pm and 9 pm. During the mornings, six women's clubs were guests of the company. Over coffee, lighting, wiring, and use of appliances was described to them.

Ceico Saturation Study . . .

on appliances gives picture of sales potential in service area. Over 8,000 families interviewed

Sellers of electric appliances in the area served by the Cleveland Electric Illuminating Co can not use lack of knowledge of their market as an alibi for failure to move their goods. Not now, not since publication of "Appliance Saturation in the Cleveland Northeast Ohio Area" by Ceico's market research section.

The service territory of the company was divided into 20 areas for the purpose of the study. A sample, stratified by geographic location and median family income, was taken by personal interviews in each area. Total of interviews among the 415,000 families in the territory was 8,259.

The study determined the saturations of all major and most minor electric, also of gas and liquid petroleum, appliances. Included also are percentages of families with more than one of each appliance, of age distributions of refrigerators and of sizes of food freezers. Potential markets for combinations of complementary appliances were calculated. The extensive coverage of the study is indicated by the accompanying summary tabulation.

Appliance Saturation in Cleveland Electric Illuminating Co. Service Area

APPLIANCES	PERCENT SATURATION		
	Cleveland-N. E. Ohio	Cleveland Met. Area	Eastern District
Television Receivers	77.7	80.3	54.8
Radios	96.8	96.7	97.2
Record Players	54.3	55.3	45.0
Total Refrigerators, Electric & Gas	97.5	97.6	96.4
Electric Refrigerators	91.1	90.8	93.6
Age Distribution	....	....	....
Food Freezers	8.0	7.2	14.7
Size Distribution	....	....	....
Electric Ranges	21.5	17.0	61.0
Gas Ranges	75.2	80.8	25.4
L. P. Ranges	1.8	1.2	7.4
Electric Water Heaters	8.3	4.3	43.7
Gas Water Heaters	82.6	89.1	24.8
L. P. Water Heaters	.5	.4	1.4
Electric Clothes Dryers	7.8	7.8	7.6
Gas Clothes Dryers	3.8	4.2	.2
Clothes Washers, Conventional	66.3	64.9	78.0
Clothes Washers, Automatic	24.1	25.2	14.4
Ironers	19.6	19.8	17.6
Hand Irons	98.5	98.5	98.5
Dishwashers—Total	3.8	4.0	1.6
Electric Waste Disposers, Sink	4.6	4.9	1.9
Electric Waste Disposers, Incinerator	.3	.3	.4
Electric Roasters	27.7	27.4	30.3
Electric Casseroles	3.1	3.1	3.1
Food Mixers and Blenders	57.8	57.6	60.0
Waffle Irons and Sandwich Grills	55.3	54.8	59.8
Bread Toasters	84.4	83.9	88.0
Electric Coffeemakers	31.4	30.6	38.5
Electric Hot Plates	10.6	9.5	20.6
Electric Clocks	84.8	84.5	87.1
Vacuum Cleaners	85.9	86.2	83.0
Portable Fans	36.0	35.7	38.9
Window Vent Fans	6.7	7.2	1.8
Exhaust Fans, Kitchen or Bath	4.7	4.8	3.9
Exhaust Fans, Attic	1.6	1.8	.6
Furnace Blowers	34.7	35.0	32.5
Room Air Conditioners	.6	.6	.1
Electric Room Heaters—Convection	17.5	16.9	23.0
Electric Room Heaters—Radiant	.2	.2	.5
Electric Bed Covers	6.7	6.7	6.4
Electric Heating Pads	44.2	43.6	49.1
Water Pumps	6.2	2.9	35.6
Sump Pumps	2.5	1.8	8.4
Circulating Pumps	1.1	.7	4.3
Space Heating S	.2	.2	.4
Stokers	2.3	1.9	5.5
Workshops with Power Tools	12.8	12.2	17.8

PROJECT SERVICE REPORT

Planning and co-ordination help CEPCO save time, money on new steam plant

1 One-line diagram is discussed by W. Fleming, Exec. Ass't. CEPCO; C. Holland, G-E Sales Engr.; and C. Ernst, V. P. and Gen. Mgr. CEPCO to start project.

2 Final drawings reviewed by H. Soliday, E.E., Fluor Corp.; W. Moody, G-E Applic. Engr. and O. Hedrich, Power Consultant and Proj. Mgr., Fluor Corp.

3 Detailed specifications are approved by W. Fleming, Exec. Ass't. CEPCO; R. R. Owen, G-E co-ordinator at Schenectady and G. Miller, G-E Sponsor Engr.

4 Connection details are worked out for first 30,000-kw generator by W. Marsh, G-E Project Engr. and J. M. Todd, G-E Generator Engr.

5 Schedule and shipment progress reports compiled by L. Warner and E. Clifford of G-E Order Service keep customer consistently up-to-date on all apparatus.

6 Plant in service, President of CEPCO, Albert Cage, gives his enthusiastic approval to the successful "ahead of schedule" completion of Highgrove.

On the line—This dramatic floodlighted night view outlines the 320,000 lb. per hr. boilers, the turbine generators and one of the two-pass side entry condensers. The two 30,000-kw units can be operated by a crew of only four men per shift.

Teamwork Helps Get Highgrove On The Line—Ahead of Schedule

The first completely outdoor steam plant to be built on the Pacific Coast, the Highgrove plant of California Electric Power Co., near Riverside, was completed ahead of schedule at an overall cost of approximately $140 per kw. G.E. was given unit responsibility for all the major electrical equipment of this base load station.

The success of this project was the result of careful planning on the part of the electric utility, the Fluor Corporation, Ltd., Engineers and Constructors . . . plus the teamwork of General Electric "Project Service."

What is G-E Project Service?

Under Project Service, a G-E team of sales and application engineers and expediters is assigned to co-ordinate the manufacture and delivery of all the electrical equipment—or any of the major components you call on G-E to supply – whether purchased directly, through your consulting engineer, or machinery manufacturer.

From preliminary one-line diagrams through final delivery, every major step is carefully engineered, scheduled, followed-up and its progress reported to you. The overall objective is to save you time, money, and engineering manpower and at the same time secure complete electrical and mechanical co-ordination.

Cuts engineering, installation time

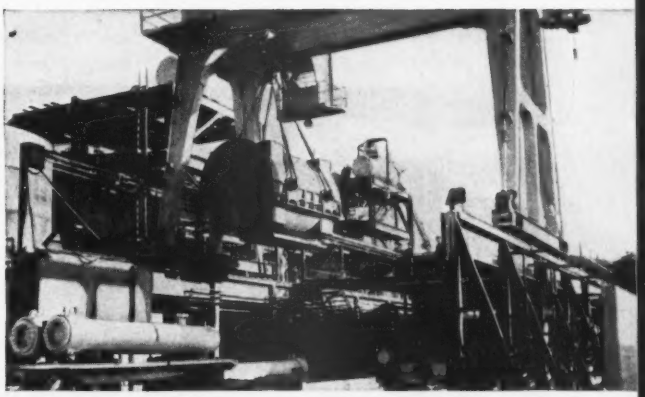
It will relieve you and your consulting engineer of many details of electrical specifications, design and manufacturing co-ordination and delivery schedules. Project Service also insures co-ordination of field engineering and installation so essential in avoiding on-site errors and getting *your* plant "on the line—on schedule."

For more details on Project Service, contact your G-E Representative, or write for GEA-6032 to Apparatus Sales Div., General Electric Company, Schenectady 5, N. Y.

302-1

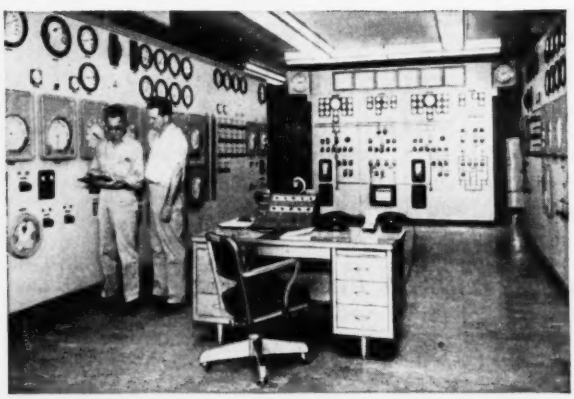
MORE POWER TO AMERICA

GENERAL ELECTRIC

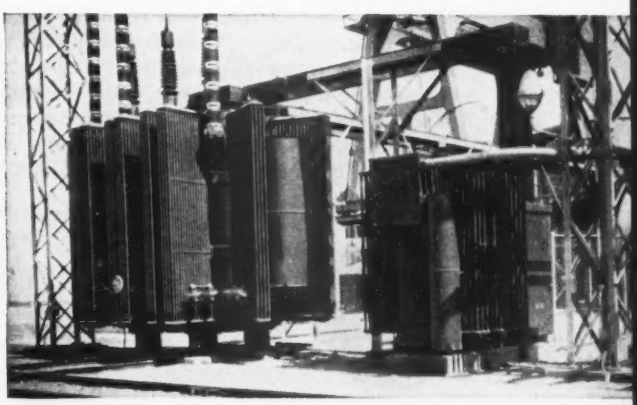


First of two 30,000-kw stators being transferred to the turbine deck from rail car. Two more 40,000-kw units will bring total plant nameplate capacity to 140,000-kw. G-E field engineers carefully check all phases of installation, assure on-the-spot supervision, unit responsibility.

G-E product specialists follow every phase of equipment selection and installation. Here turbine engineer R. B. Barton (center) inspects exciter with O. Hedrich, Fluor Corp. and Highgrove engineer A. A. Lingo.



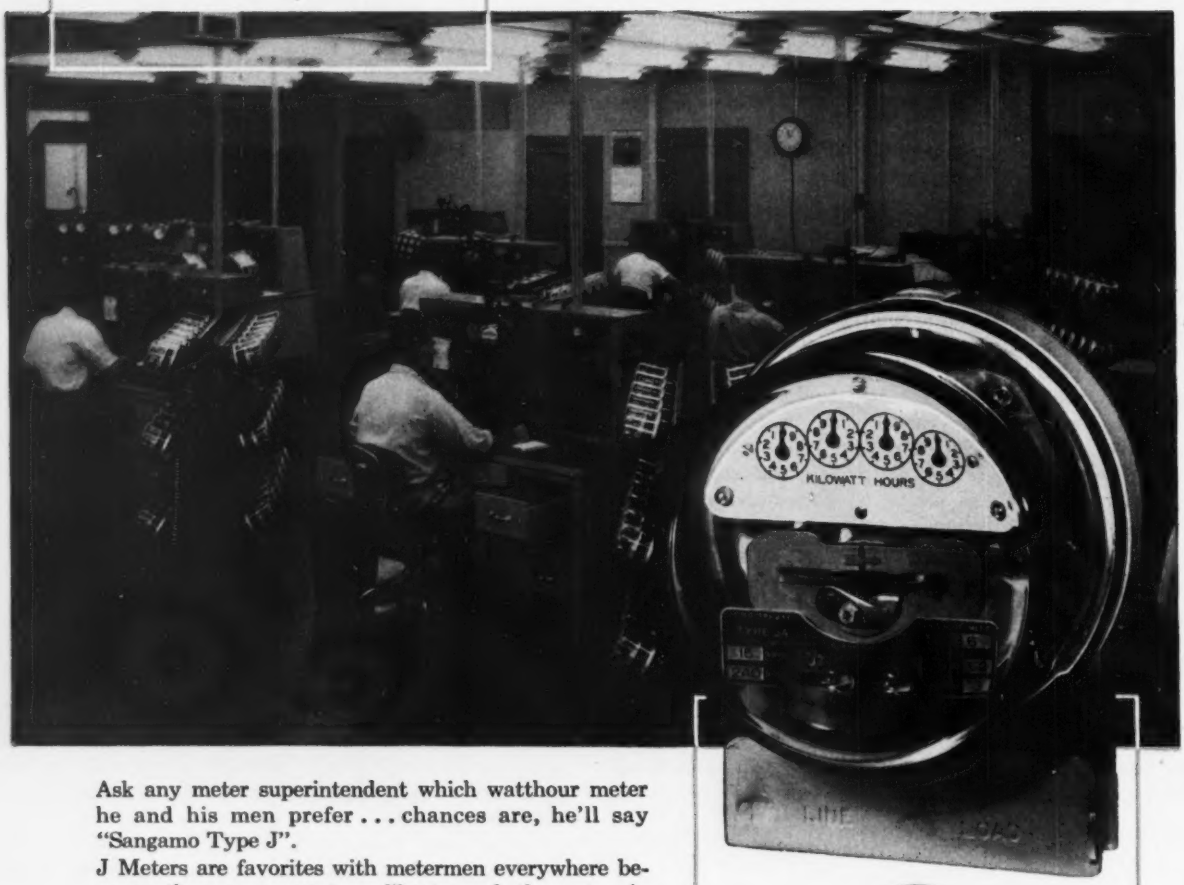
In this control room one small master control switchboard (far end of room), maintains a perfect working relationship of all equipment for the proper operation of the entire plant.



Co-ordinated engineering of project means easy installation, neat final appearance of outdoor equipment. Clean yard here has 30,000/37,500-kva power transformer and 3,000-kva station service transformer.

a full measure of acceptance

Sangamo J Meters



Ask any meter superintendent which watthour meter he and his men prefer . . . chances are, he'll say "Sangamo Type J".

J Meters are favorites with metermen everywhere because they are easy to calibrate and they *stay* in calibration! They do facilitate the maintenance and testing program of the meter department—and they are known for extremely long troublefree service.

Sangamo J Meters are built to provide the unchanged accuracy necessary to measure all the electricity delivered over a period of many years. Careful attention to those qualities necessary for accurate measurement with minimum maintenance has always guided the design and manufacture of Sangamo Meters.

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

Only Measured Facts are Known Facts

JM53-6

Guatemala Holds U.S. Utility

GUATEMALA CITY (McGraw-Hill World News)—Empresa Electrica, S. A., the $15-million power company investment of American Foreign Power Co in Guatemala, this month was still being held by the Guatemalan government after having been taken over during a labor dispute.

President Jacobo Arbenz appointed former Minister of Economy and Labor Alfonso Bauer Paiz, on July 17 as "interventor" or manager of the company when a 10-hour strike of employees over wage increase demands caused a complete shutdown of the company's power plants. Empresa Electrica supplies an estimated 80% of all electricity produced in the republic. The company serves an estimated population of 335,000 in 12 communities in Guatemala.

The president declared the strike an "emergency", appointed the interventor and ordered the 500 employees of the company back to work. Meanwhile the wage dispute has been referred to a government labor court. No action has been taken by the court since that time and early action is not expected.

The government at the time of the intervention, placed four auditors and accountants in the Empresa Electrica's offices. They have been making a complete audit of the company's books.

S. A. Hammond, general manager of Empresa Electrica, has publicly charged that the government and investigation is "unwarranted and illegal."

Wage increase demands amount to an average of 60% increase over the present levels. The company claims it cannot meet the increases without an electric rate increase which the government will not permit.

The Labor Court now considering the dispute has it within its power to grant the increases and to order the company to pay all the employees double wages during the period of intervention by the government.

Today's Pay of a 5-Year Grad

How is the college engineering graduate of five years ago doing today?

To get this answer Illinois Institute of Technology, Chicago, Ill., made a survey of the class of 1948. IIT came up with some interesting statistics on these graduates.

Financially the '48 graduate is doing very well. In fact, he has bettered himself just about 100% in the five year period. He started work after graduation at an annual salary of $3,180. Today he is earning around $6,340.

On an over-all basis, 96% of the '48 class earn more than $4,500 yearly; 76% earn more than $5,500; 46% make more than $6,500, and 17% are earning $7,500 or more annually.

Present age of the IIT class studied in the survey ranges from 24 to 40 years of age, with 29 being the average age. There was no discernible correlation between salary and age.

The survey did show, however, a definite relationship between salary and family status. Those graduates who had the greater number of dependents also had the larger salary income.

Here are the salary-family status figures:

Family Status	% of Class	Average Salary
Single	21	$5,779
Married, no children	11	6,066
Married, 1 child	27	6,537
Married, 2 children	28	6,560
Married, 3 children	10	6,866
Married, 4 children	3	7,000

Summing up, the average 1948 graduate of Illinois Tech looks something like this: He is 29 years old, married, has one or two children and earns $6,340 a year.

LABOR BRIEFS

The Congress of Industrial Organization executive board has approved a "non-raiding" pact with the American Federation of Labor. The CIO board has urged that the CIO national convention adopt it in November. The AFL executive council has already approved the pact and similarly urged adoption at its annual convention in September.

How to get employee participation in planning for profit will be discussed at American Management Association's national office management conference to be held Oct. 12-14 at the Hotel Astor, New York, by Henry C. Egerton, treasurer, BullDog Electric Products Co. A report on Detroit Edison Co's experience in increasing office productivity through job enlargement will be presented by J. Douglas Elliott, supervisor, customers billing department.

Kansas State College will present degrees in nuclear and industrial engineering beginning with the fall semester, according to Pres James A. McClain. The college conferred with Atomic Energy Commission representatives before submitting the new curriculum to the regents for approval. The nuclear curriculum combines fundamentals of atomic energy and radiotracer techniques with basic engineering courses in mechanics, unit operations, thermodynamics, and design.

For free copy of "National Apprenticeship and Training Standards for the Electrical Contracting Industry," write the Bureau of Apprenticeship, U. S. Department of Labor, Washington 25, D. C.

Westinghouse Electric Corp and the International Union of Electrical Workers, CIO, and the International Brotherhood of Electrical Workers, AFL, have signed agreements providing wage hikes ranging from 3 to 11¢ an hour and higher pensions. Clerical salaried employees of IUE will receive equivalent pay rises ranging from $5.20 to $19 a month. The increases are retroactive to July 1.

Changed Value of Dollar . . .

. . . should be recognized in computing allowable depreciation deduction for income taxes, spokesmen testify at tax hearing

At hearings on new income tax legislation before the House Ways and Means Committee recently, a number of accountants, economists, and utility executives testified on the importance of giving recognition to the changed value of the dollar in computing the allowable depreciation deduction for income tax purposes.

Dr William Paton of the University of Michigan made the point that the recovery of the cost of capital, which is presumably what the depreciation allowance is intended to do, was not achieved under the present computation based on original cost. One of the illustrations that he used was to the effect that the owner of a boiler is supposed to recover the cost of using up the boiler just as much as the coal burnt in the boiler's grate in determining the net taxable income.

Depreciated Dollar . . . He said that due to the depreciation in the value of the dollar the true economic cost of depreciable assets is not being properly amortized. Thus the actual result of the present method of computing net taxable income is that capital is being confiscated on a large scale for the benefit of the users of the service. He made the point that this is particularly true in the case of public utilities where assets represented by dollars of varying purchasing power are being treated as if they were identical dollars having equal purchasing power.

"The necessity of conversion in such circumstances," he said, "in computing depreciation deductions for tax purposes has been officially recognized in some countries abroad but this has not yet been done in this country, despite widespread discussion of the subject by leading accountants and other interested parties."

In order to treat this condition equitably, he continued, it would be necessary to convert all the dollars to one level of purchasing power, namely the current 1953 dollars.

The Michigan professor went on to say that this matter is especially serious for the industry where substantial assets were acquired 10 years ago or even more and where the service life extends for 20 to 30 years and the income of which is rigidly controlled through the regulatory process.

Capital Erosion . . . "There has already been an enormous erosion of capital in these enterprises," he continued, "through failure to collect revenues from customers matching the true cost of plant consumed in operations, and if these enterprises are to remain in private hands, and to continue to attract the necessary flow of funds under a sound capital structure, it is imperative that they be permitted to retain from revenues, not subject to tax, the funds necessary to make good the plant investment consumed in rendering service, measured in the same kind of dollars from year to year as are being used to measure revenues."

Dr Paton concluded that the present purchasing power of the dollar is here to stay and that any attempt to increase the value of the dollar would produce new stresses, strains, and dislocations as great as those which occurred during the last 13 years.

F. Warren Brooks, Cleveland Electric Illuminating Co, outlined the general problem of the inadequacy of the original cost basis for depreciation allowance during an inflationary period. He said that the present method of computing taxable depreciation overstates income and consequently results in a tax levy on capital.

He went on to point out the fact that utilities with their very heavy plant investment are far more suscepible than other major industries to this unintended capital levy. The utilities are further at a substantial disadvantage compared with other industries because of the fact that their revenues are strictly regulated and consequently such taxation of capital cannot be as easily offset as with, say, the manufacturing or commercial enterprises.

Leonard Spacek, managing partner of Arthur Andersen & Co, made the statement that the present practice of computing depreciation in original cost was in error and that this error became progressively greater as the life of the property increased. Since utilities have generally long-lived property, the present method of accrued depreciation would have a greater effect on them than on other corporations.

He went on to say:

"1. It is proper and sound accounting to compute depreciation on the basis of cost adjusted for the changes in price level. The accounting concept of computing depreciation to recover the original cost of property was sound under a stable price level. It does not perform its function of maintaining service capacity of property in periods of major changes in the purchasing power of the dollar.

"2. The computation of depreciation adjusted for the change in the price level since the property was built can be accomplished in a simple manner so that it can be easily administered.

"3. The principle of removing the inequities in the computation of depreciation resulting from varying price levels is not new. It is recognized in the present tax law—by the use of Mar. 1, 1913, value of all plant constructed prior to that date.

"4. If adjustment for depreciation due to the drastic price level changes is now allowed for tax purposes—such an adjustment will automatically be reduced and eliminated as old property is replaced with new plant. Therefore the adjusted allowance for depreciation over orthodox cost depreciation is a transition allowance that will disappear as the price level becomes stabilized. The adjustment of depreciation would exist only until the low price-level property is retired.

"5. Such a depreciation adjustment is required if equitable treatment among taxpayers is to prevail."

Tax Equality . . . Charles E. Oakes, chairman of the Edison Electric Institute's special tax policy committee and president of Pennsylvania Power

& Light Co presented to the committee a statement and 12 charts concerning "tax equality."

He said "While tax inequality between lines of endeavor is serious, tax inequality within a single field of business is unbearable. The electric companies suffer severely because a growing segment of our industry is completely free of federal income tax. The Federal Government and state and municipal bodies are taking advantage of this very valuable special privilege to supplant the taxpaying electric companies."

FINANCIAL BRIEFS

Dividend Increases—Pacific Gas & Electric Co will pay Oct. 15 a quarterly common stock dividend of 55¢ a share as compared with 50¢ in the previous quarters . . . Florida Power Corp will pay Sept. 20 a common quarterly dividend of 37½¢ a share as compared to 30¢ in the previous quarters . . . Texas Utilities Co will pay a quarterly common stock dividend of 52¢ a share as compared with 47¢ a share in previous quarters.

Missouri Public Service Co is planning to sell $2.5 million 4.20% first mortgage bonds due in 1983 . . . Blyth & Co has sold quickly a secondary offering of 5,000 common shares of Boston Edison Co at 48⅛.

Mountain States Power Co has asked the Federal Power Commission for approval to sell $8 million 4¼% first mortgage bonds due in 1983 to seven insurance companies.

REGULATION

Pennsylvania Public Utilities Commission has suspended until Dec. 1 the $4.8 million rate increase requested by the Duquesne Light Co. PUC said it needs more time to complete its investigation of the increase opposed by the City of Pittsburgh.

New York State Electric & Gas Corp has received PSC approval to unite its Long Lake District with its Plattsburg District on Sept. 8. The corporation will effect a net annual reduction in rates by about $17,370 a year in the Long Lake District.

Today in Utility Finance

YIELDS (%)

Quality	Bonds			Preferred Stocks			Common Stocks		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
DATE									
1953									
Aug. 20	**3.28**	**3.32**	**3.51**	**4.31**	**4.51**	**4.77**	**5.27**	**5.80***	**5.83**
Aug. 13	3.26	3.31	3.51	4.31	4.48	4.77	5.30	5.60	5.79
END OF QTR									
2nd 1953	3.34	3.46	3.64	4.47	4.70	4.88	5.52	5.93	6.10
1st 1953	3.15	3.23	3.39	4.16	4.41	4.66	4.95	5.24	5.50
4th 1952	2.99	3.03	3.14	4.06	4.22	4.59	4.98	5.33	5.62
3rd 1952	2.99	3.03	3.16	4.10	4.26	4.61	5.18	5.59	5.96

Data: Reis & Chandler, Inc.
Notes—*Reflects increased dividends by Pacific Gas & Electric Co and Florida Power Corp.

EARNINGS

Company	Period Months Ended		Net Income 1953	Net Income 1952	Earnings Per Common Share 1953	Earnings Per Common Share 1952
Carolina Power & Light	12	July	$7,202,449	$6,679,543	$....	$....
Central Illinois Light	12	July	3,419,319	2,950,294	3.24	2.72
Cincinnati Gas & Electric, consolidated	12	June	10,624,912	10,278,593	1.49	1.43
Citizens Utilities	12	June	831,275	716,546	0.95	0.82
Cleveland Electric Illuminating	12	June	13,752,400	12,162,925	3.77(a)	3.95(a)
General Public Utilities, domestic subsidiaries only	12	June	16,757,394	13,750,816	1.95(b)	1.71(b)
Houston Lighting & Power	12	July	9,909,526	7,794,818	....	....
Ohio Edison, consolidated	12	July	18,087,528	14,760,324	2.97(c)	2.73(c)
Oklahoma Gas & Electric	12	July	6,053,375	5,281,638	1.95(e)	1.82(e)
Pacific Gas & Electric	12	June	54,195,196	41,574,535	2.82(f)	2.40(f)
Pennsylvania Power	12	July	2,295,135	1,983,194	....	....
Southern Canada Power	10	July	1,192,186	981,797	....	....
Southern Indiana Gas & Electric	12	July	2,083,150	1,788,221	2.09(g)	2.01(g)

Notes—Based on 3,342,308 shares in 1953 and 2,789,476 shares in 1952; (b) Based on average number of shares outstanding; (c) Based on 5,278,306 shares in 1953 and 4,798,460 shares in 1952; (e) Based on 2,653,140 shares in 1953 and 2,411,945 shares in 1952; (f) Based on 13,627,720 shares in 1953 and 11,356,420 shares in 1952; and (g) Based on 799,167 shares in 1953 and 685,000 shares in 1952.

FINANCING

Company and Description	Amount of Offering ($000)	Offering Price	Yield to Public
WEEK OF AUGUST 20–26			
Bonds			
Southern California Edison—1st mtg 3⅛% due 1978	$30,000	100%	3.625%
Preferred Stock			
Wisconsin Power & Light—20,000 sh 4.8% $100 par cum (being offered 4½% and 4.80% preferred holders record Aug. 14 to expire Sept. 8 without limit; an oversubscription will necessitate an allotment)	$2,000	$100.00	4.80%
Common Stock			
Wisconsin Power & Light—329,194 sh (being offered commonholders on 1-for-7 basis, record Aug. 14 to expire Sept. 8; unsubscribed to employees)	$6,452	$19.60	6.12%
SCHEDULE FOR AUGUST—SEPTEMBER—OCTOBER			
Bonds			**Bid Date**
Wisconsin Power & Light—1st mtg due 1983	$8,000	.....	Aug. 31
Duke Power—1st and refunding mtg due 1983	35,000	.....	Sept. 1
Crawfordsville, Ind—electric revenues 1956–74	1,350	.....	Sept. 8
Public Service of New Hampsire—1st mtg due 1983	7,000	.....	Sept. 14
Louisiana Power & Light—1st mtg due 1983	12,000	.....	Sept. 16
Duquesne Light—1st mtg due 1983	12,000	.....	Sept. 22
Richmond, Ind—electric revenues 1954–84	6,000	.....	Sept. 23
Indiana & Michigan Electric—1st mtg due 1983	15,000	.....	Sept. 29
Mississippi Power—1st mtg due 1983	4,000	.....	Oct. 6
Debentures			
Central Hudson Gas & Electric—conv debs due 1963	$6,000	.....	Sept. 9
Preferred Stock			
Duquesne Light—100,000 sh $50 par	$5,000	.....	Sept. 17
Common Stock			
Duke Power—208,321 sh (to be offered commonholders on 1-for-20 basis, record Sept. 2 to expire Sept. 18 without underwriting)	$6,250	$30.00	5.00%
Central Hudson Gas & Electric—139,978 sh (to be offered commonholders on 1-for-15 basis, record Sept. 9 to expire Sept. 25)	.....	.....	.....
Pacific Gas & Electric—1,946,829 sh (to be offered commonholders on 1-for-7 basis, record Sept. 15 to expire Oct. 2)	.....	.....	.....
Central Illinois Public Service—350,000 sh	.....	.....	Sept. 9
Duquesne Light—150,000 sh (a)	.....	.....	Sept. 15
New England Gas & Electric—194,916 sh (to be offered commonholders on 1-for-10 basis, record about Sept. 30)	.....	.....	.....
Hartford Electric Light—105,500 sh (to be offered commonholders on 1-for-8 basis)	.....	.....	.....

Notes—(a) In addition 34,739 shares will be sold by Standard Power & Light Corp.

Sound Design

. . . WITH 38 YEARS ON THIS LINE TO PROVE IT!

O-B pintype insulators were installed on this 13.2-kv line 38 years ago. It's not too easy a spot -- contamination has become worse than average, terrain is mountainous, average storm frequency over 36. The insulation shows no apparent deterioration, and replacements due to all causes have been negligible.

Performance such as this can mean only one thing -- basically sound design and faithful interpretation of that design into an equally sound product.

Where reliability is the first consideration, you can place absolute confidence in the service background and manufacturing ability behind O-B pintype insulators.

Ohio Brass

MANSFIELD OHIO, U.S.A.

IN CANADA: CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

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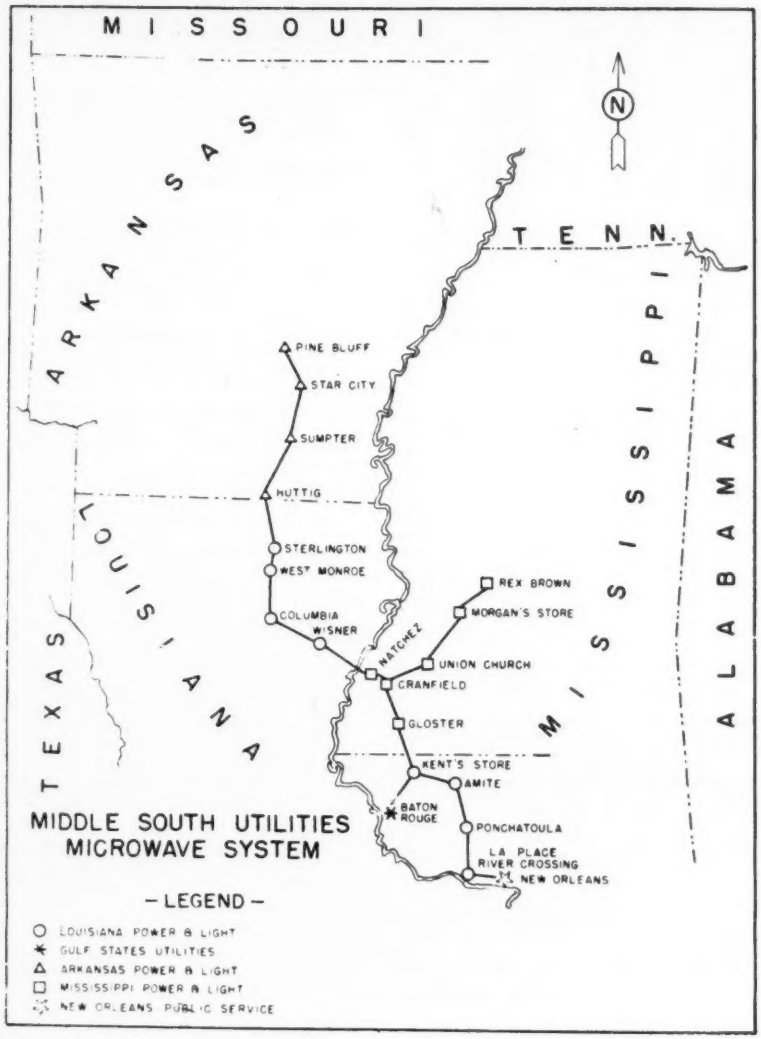


MAP OF MIDDLE SOUTH UTILITIES, INC, microwave system shows interconnections among Gulf States Utilities, Inc, and following Middle South companies: Louisiana Power & Light, Arkansas Power & Light, Mississippi Power & Light, and New Orleans Public Service

Microwave Net Contracts . . .

. . . are awarded to Motorola by Gulf States Utilities and Middle South Utilities. Equipment is for 490-mile system

Motorola Communications & Electronics, Inc, has been awarded $500,000 in "turn-key" contracts for an extensive microwave relay system by five south central utilities. The utility group consists of Gulf States Utilities, Inc, and Middle South Utilities, Inc, which includes Louisiana Power & Light Co, Arkansas Power & Light Co, Mississippi Power & Light Co, and New Orleans Public Service, Inc.

This 490-mile communications network, reported to be the largest of its type in the world in terms of channel miles, will extend into three states, Louisiana, Mississippi, and Arkansas. Scheduled to be in operation before the end of 1953, the system will facilitate supervision and control of power distribution for consumers served by the utilities.

Includes 20 Stations . . . The system will consist of 20 stations including 16 repeater installations and four terminals extending from the system dispatcher's office of Arkansas P&L at Pine Bluff, Ark., down to the New Orleans Market Street Station of New Orleans PS. Two stub circuits will extend from the main trunk to tie the Jackson, Miss., Rex Brown Steam Electric Station of Mississippi P&L and Baton Rouge Station of Gulf States Utilities to the microwave system.

The 24 channel basic equipment to be installed will ultimately provide 11,760 channel miles. Initial channel utilization plans call for approximately 8,000 operating channel miles of private line, party line, teletype, audio frequency carrier for telemetering, supervisory control and mobile radio control circuits.

System Surveillance . . . Audio frequency carrier channels will provide telemetering facilities for complete distribution system surveillance. Tie line and generating indications will be transmitted from all principle points to the dispatcher over the microwave system. Telemetered data will include metering of key lines and net interchange of megawatts. The communications network will work into automatic control systems, governing principle power plant load controls to supervise and maintain optimum economy of load distribution. Supervisory control carried over the microwave system, together with power line carrier interconnects, will allow remote control of more than 40 unattended substations.

Microwave equipment will operate in the 6,800 megacycle range. Station installations will feature tower top 45° angle passive reflectors allowing all electronic equipment, R. F., multiplex, and termination, to be installed on ground level. The average distance between stations is just over 25 miles.

MANUFACTURING BRIEFS

General Electric Co's Industrial Power Components Division plans to build a $5-million plant at Bloomington, Ill., for manufacture of general purpose controls for industrial use. Construction will start at the end of the year on a 66-acre site. GE plans to install

more than $2 million of equipment in the new plant, which will consist of a manufacturing area, warehouse, laboratory, cafeteria, and office building.

Primary aluminum production in June reached 208,303,690 lb, the Aluminum Association has reported. June output was more than 2½ million lb under May's 210,953,111 lb. Despite the drop a new quarterly record was set for the second time this year. The 623,399,569 lb in the second quarter was 9% over the record first quarter's production. For the first half of 1953, production totaled 1,197,407,109 lb, about 30% over the 923,072, 606 lb for the same period of 1952.

SALES ASSIGNMENTS

COMPANY STAFFS

Westinghouse Electric Corp has named Willis L. Winter distribution apparatus manager for its Pacific Coast district. Winter, who joined Westinghouse in 1916, formerly was assistant to the manager of the district's electric utility department.

Appleton Electric Co has appointed E. A. Hakanson, field engineer in the Chicago district, manager of that district, which includes northern Illinois and Wisconsin. Associated with Appleton for 32 years, Hakanson will operate directly from the Appleton general offices at 1701-1759 Wellington Ave., Chicago.

Libbey-Owens Ford Glass Co's Fiber Glass Division has promoted Thomas L. Carver from its New York sales staff to district manager there to succeed A. K. McClay, resigned. Ralph G. Cox, who established sales representation for the division in the Southeastern states, has been advanced to district manager for that region with offices in Charlotte, N. C. The division has also assigned Edward A. Turner to its Chicago district office as a sales representative.

Mitchell Manufacturing Co, Chicago, has assigned Bruce E. Crockett to the Wisconsin district sales staff with headquarters in Milwaukee.

Okonite Co. Passaic, N. J. has appointed Thomas J. Manning district manager of its Cincinnati office. Manning has been with Okonite as a sales engineer in the Birmingham (Ala.) district office since 1946.

General Dynamics Corp's Electro Dynamic Motor and Generator Division has named William G. Hill as sales-engineer to serve in New England.

MEETINGS CALENDAR

Public Information Program
Inter-Regional Committee, Blackstone Hotel, Chicago, Sept. 1; West North Central Region, River Inn Hotel, Fergus Falls, Minn., Sept. 24; East North Central Region, Columbus, Ohio. Sept. 25; Mid-Atlantic Region, Baltimore, Md., Sept. 30; Steering Committee Edgewater Beach Hotel, Chicago, Oct. 21; Workshop Conference Edgewater Beach Hotel, Chicago, Oct. 22-23.

American Institute of Electrical Engineers
Pacific General Meeting, Hotel Vancouver, Vancouver, B. C. Sept. 1-4; Middle Eastern District Meeting, Daniel Boone Hotel, Charleston, W. Va., Sept. 29-Oct 1; Conference on Application of Motors to Air-Moving Equipment and Symposium on Induction Motors, Hotel Van Orman, Fort Wayne, Ind., Oct. 6-8; Fall General Meeting, Muehlebach Hotel, Kansas City. Mo., Nov. 2-6.

Edison Electric Institute
Commercial Sales Section Committees, EEI headquarters, New York, Sept. 3-4; EEI-AGA Accounting Division Organization Meeting, Hotel Statler, Detroit, Sept. 15-18; Accident Prevention Committee, Radisson Hotel, Minneapolis, Sept. 21-22; Prime Movers Committee, Detroit, Oct. 5-6; Transmission-Distribution Committee, Hotel Nicollet, Minneapolis, Oct. 8-9; Industrial Relations Committee, Fall Round-Table Conference, Sheraton Hotel, Chicago, Oct. 12-14; Meter-Service Committee, William Penn Hotel, Pittsburgh, Oct. 19-21; Electrical Equipment Committee, Jung Hotel, New Orleans, Nov. 2-3.

Illuminating Engineering Society
National Technical Conference, Hotel Commodore, New York, Sept. 14-18.

Northwest Public Power Association
Accounting Section, Monticello Hotel, Longview, Wash., Sept. 17-18.

Public Utilities Association of Virginias
Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va., Sept. 17-20.

Maryland Utilities Association
Fall Conference, Cavalier Hotel, Virginia Beach, Va. Sept. 18-19.

Rocky Mountain Electrical League
50th Annual Fall Convention, Broadmoor Hotel, Colorado Springs, Colo., Sept. 20-23.

National Association of Railroad and Utilities Commissioners
Hotel Roosevelt, New York, Sept. 20-26.

Missouri Valley Electric Association
Accounting Conference, President Hotel, Kansas City, Mo., Sept. 21-22; Sales-Rural Conference, President Hotel, Kansas City, Mo., Oct. 7-9.

Instrument Society of America
8th National Instrument Conference-Exhibit, Sherman-Morrison Hotels, Chicago, Sept. 21-25.

International Association of Electrical Inspectors
Silver Jubilee Meeting, Edgewater Beach Hotel, Chicago, Sept. 21-26.

* **Pennsylvania Electric Association**
Annual Meeting-Business Conference, Benjamin Franklin Hotel, Philadelphia, Sept. 22-23; Fall Meeting, Relay Committee, Irem Temple Country Club, Dallas, Pa., Oct. 1-2; Joint Meeting of Transmission-Distribution Committee and Electrical Equipment Committee, Abraham Lincoln Hotel, Reading, Pa., Oct. 8-9; Meter Committee, Fall Meeting, Brunswick Hotel, Lancaster, Pa., Oct. 22-23.

Electric Lines Club of New England
Fall Meeting, University Club, Boston, Sept. 23.

New England Meter Engineers
Fall Meeting, Casco Lodge, Casco, Me., Sept. 24-25.

National Electrical Industries Show
Sponsored by Eastern Electrical Wholesalers' Association, 69th Regiment Armory, New York, Sept. 29-Oct. 2.

Great Lakes Power Club
Plankinton House, Milwaukee, Wis., Oct. 1-2.

Southeastern Electric Exchange
Fall Meeting, Engineering-Operation Section, Carolina Hotel, Pinehurst, N. C., Oct. 1-2; Accounting Conference, Battery Park Hotel, Asheville, N. C., Oct. 15-16; General Sales Conference, Atlanta Biltmore Hotel, Atlanta, Ga., Nov. 19-21.

Interstate Power Club
Hotel Martinique, New York, Oct. 5; Hotel Martinique, New York, Dec. 7.

American Society of Mechanical Engineers
Fall Meeting, Sheraton Hotel, Rochester, N. Y., Oct. 5-7; Annual Meeting, Statler Hotel, New York, Nov. 29-Dec. 4.

Electric League of Western Pennsylvania
4th Industrial Electric Exposition, William Penn Hotel, Pittsburgh, Oct. 6-8.

Association of Edison Illuminating Companies
Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va., Oct. 8-10.

National Association of Electrical Distributors
Fall Meeting, Pacific Zone, Hotel del Coronado, Coronado, Calif., Oct. 11-14.

Electrical Association of Philadelphia
Biennial Electric Progress Show sponsored by Manufacturers' Division, Convention Hall, Philadelphia, Oct. 13-15.

American Standards Association
4th National Standardization Conference and 35th Annual Meeting, Waldorf-Astoria, New York, Oct. 19-21.

University of Texas
Power Distribution Conference, Department of Electrical Engineering, Lower Colorado River Authority Auditorium, Austin, Oct. 19-21.

Oklahoma Utilities Association
Electric Light and Power Division, Eastern District, Vinita, Okla. Oct., 22; Western District, Norman, Okla., Oct. 23.

National Electrical Manufacturers Association
Annual Meeting, Haddon Hall, Atlantic City, N. J., Nov. 9-12.

Wisconsin Utilities Association
Electric-Gas Section Convention, Schroeder Hotel, Milwaukee, Nov. 11-13.

Pacific Coast Electrical Association
Annual Hawaiian Conference, Honolulu, T. H., Nov. 19-20.

Public Utilities Advertising Association
Region Two Annual Meeting, Skytop, Pa., Dec. 10-11.

* **Addition this week.**

MANUFACTURERS' EARNINGS

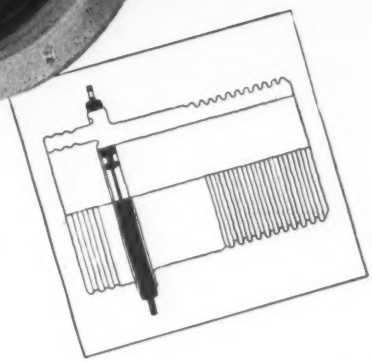
Company	Period Months Ended		Net Income 1953	Net Income 1952	Earnings Per Common Share 1953	Earnings Per Common Share 1952
Bridgeport Brass	6	June	$2,874,774	$1,911,866	$3.01	$2.01
Joseph Dixon Crucible	6	June	129,006	23,195	2.58	.46
I-T-E Circuit Breaker	6	June	1,237,255	1,332,418	....	....
Revere Copper & Brass	6	June	4,982,470	3,168,039	3.87	2.46

Correction

E. H. Schoonmaker has been appointed manager of the St. Louis district sales office of the Eddystone Division of Baldwin-Lima-Hamilton Corp. L. A. Hester, whom Electrical World stated in the July 27 issue was named to that post, is manager of sales of the division, a position he has held for some time.

THIS IS A MULTIPLE-DUTY INSULATOR:

BUSHING, BAFFLE, SUPPORT



Combined in this one assembly are a baffle insulator for supporting and sectionalizing the surrounding chamber of a totally enclosed tubular bus . . . and a porcelain bushing for a current transformer secondary. The combination in one unit creates a design which, even at Lapp, is a "difficult piece."

The porcelain is nearly 20″ in diameter, 25¼″ long, and weighs about 120 pounds. In this plant, its size and weight alone present no special problem, but difficulty does arise when such weight is combined with several other complicating factors. In the first place, the inside of one end is corrugated, an unusual and difficult operation. Then, at the point where internal and external hardware are attached, the total wall thickness is 3¼″—which poses a nice firing problem. Too, the diameters of the two ends are different, presenting a peculiarly difficult counterbore.

Only the finest electrical porcelain, skillfully produced and understandingly handled, combined with critically-controlled firing, could successfully produce such pieces. We are proud of them.

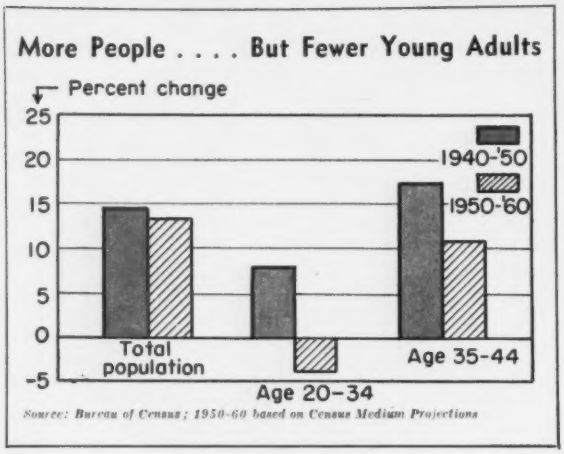
The plant superintendent is glad that not all insulators required in the electrical power industry are so complicated. He does point out, however, that his team did produce these pieces successfully, and that the same ceramic body, the same production techniques and skills, go into all insulators which bear the LAPP name. He wants it known that all Lapp products—components for system equipment, as well as insulators for transmission and station use—are built to give an extra margin of operating security, long life, and low upkeep.

His conviction merits your confidence.

Lapp Insulator Co., Inc., Le Roy, N.Y.

Lapp

ELECTRICAL BUSINESS OUTLOOK



Population Keeps Soaring . . .

. . . but the increases are in age groups that contribute little to more electric power sales

The U. S. population is still growing fast. It passed the 160 million mark in August—up nearly 9 million since the 1950 Census. And it's likely to hit 170 million sometime before the next census unless a war or bad depression brings a sharp change in present trends.

In some countries, population growth is a curse. It just means more mouths to feed. But in the U. S., it's generally counted a blessing. Most experts think that more Americans mean more and better business—bigger sales of all kinds of goods, from automobiles to electricity.

This may be true, in the long run. But population growth probably won't be a big source of increased electric power consumption in the next few years—especially by comparison with the period since 1940.

The reason shows up in a closer look at the population figures. The big current and near-future increases are in the youngest and oldest age groups—under 20 and over 44. The numbers of young adults will not change much between now and 1960.

The 20 to 44-Year Olds Set Up Homes . . . The trouble is that babies and small children don't buy houses, and most older people already have them. The big additions to the demand for separate dwelling units—and especially personal ownership of houses—come from the age groups between 20 and 44 years.

The chart above illustrates the problem. Population is expected to rise by perhaps 13% between 1950 and 1960—plus or minus a few percent depending on birth rates in the next few years. But the number of people aged 20-34 years is expected to decline by about 4%.

This decline has already started. But its effects have largely been offset by a boom in housing caused by the backlog of wartime demand plus the extra stimulation of a general business boom. Once these special stimulants wear off, the basic addition to the numbers of young adults will be more important.

The next age group—35-44 years—is not so important in new demand for total dwelling units. Most of these people have been living in separate quarters since they first were married. But they are important in demand for new houses. Home ownership takes a big jump in these ages.

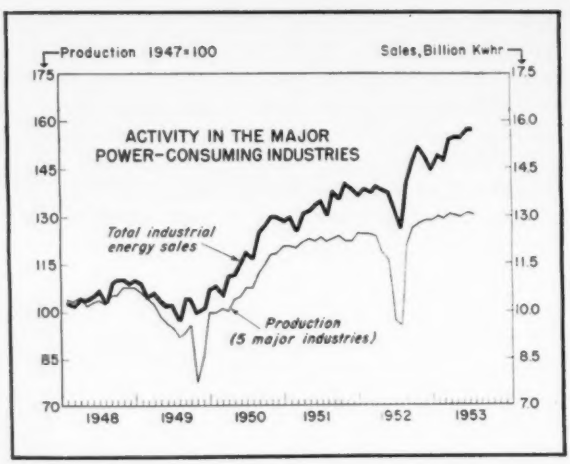
All of this means that home building—both for renting and personal ownership—won't get such a big boost from population growth in the near future. That means a loss of a basic source of strength to the industry.

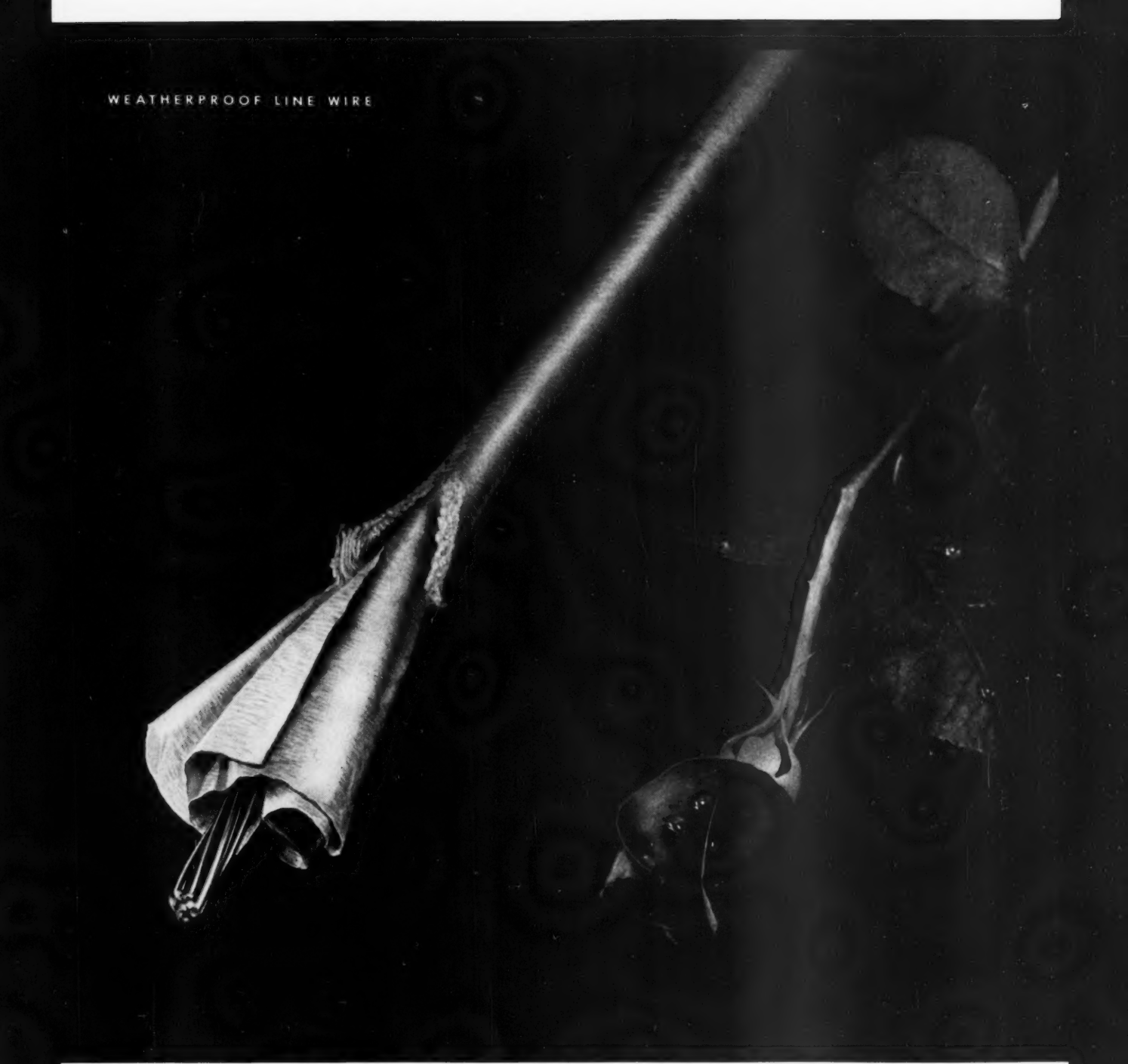
But Other Age Groups Do Boost Power Sales . . . Fortunately, these are not the only groups that are important in contributing to demand for new housing. Home ownership does increase in older groups, although not so fast as in the younger ones. And the population between ages 45 and 64 is expected to grow by about 18% in the 1950's.

In addition, babies do help boost electricity consumption in some ways. They create needs for dishwashers, dryers, washers, and ironers to make being a mother a somewhat easier task. And their parents may be tempted to move into a larger house which could boost housing demand.

Then, too, children do eat food, wear clothes, ride bicycles, and use other manufactured products. So any increase in the younger population can help keep up industrial production, and that helps boost electric power consumption.

But it's still true that the full benefit of these new consumers will not be felt in the economy until they grow up and start buying their own houses and durable goods. For the 20-34 age group, the increase won't become marked until the middle and late 1960's. And for the 35-44 age group, there won't be any more really big increases until after 1970.





The section of Duraline has been photographed with covering unsaturated to show construction.

SERVICE DEPENDABILITY

Duraline, like a rosebud, keeps moisture out

Duraline's unique construction — an exclusive continuous interlocked fibrous sheath, thoroughly impregnated with URC saturants, then covered with URC finishers—provides finest weatherproof performance and service dependability. Won't festoon, stays right there on the job. Provides added protection against contact with foreign objects.

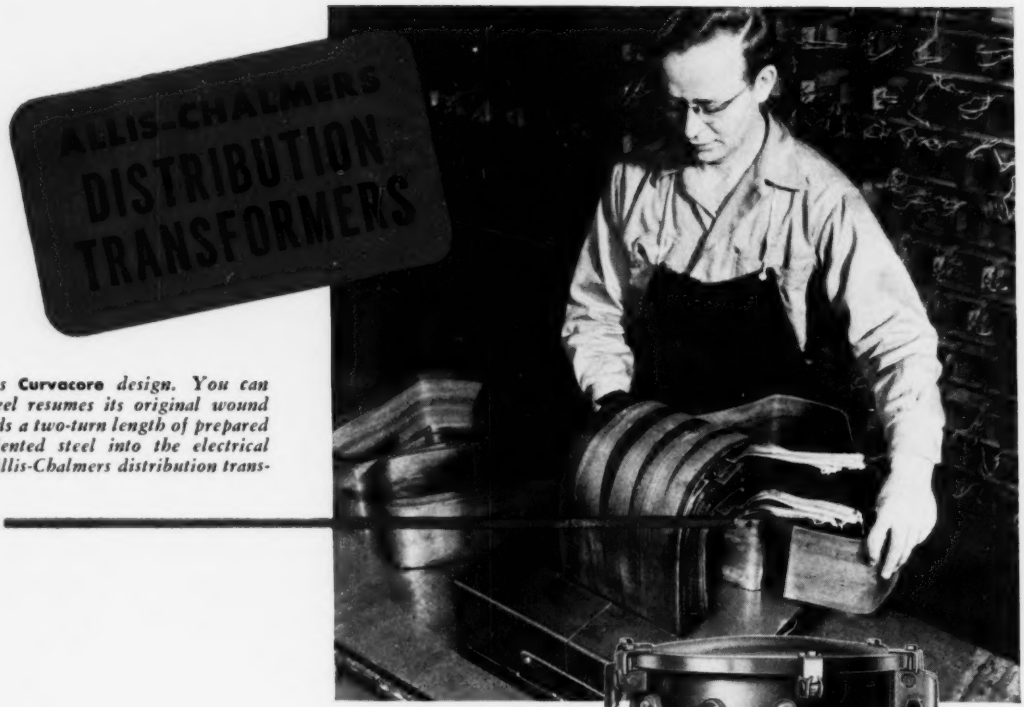
Duraline* is your best insurance against bad weather. Only Anaconda makes a line wire like this. Available with copper, Copperweld or aluminum conductors. *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.* 53926

*Reg. U. S. Pat. Off.

ANACONDA®

service and overhead distribution cables, both bare and weatherproof, including ACSR • signal, control and communication wire • portable cords and cables • network cables • airport and street lighting cables • mine cables • magnet wire • copper, aluminum, and copperweld conductors • wire and cable accessories.

How CURVACORE Design Improves Transformer Performance



Picture illustrates **Curvacore** *design. You can see how core steel resumes its original wound shape as man feeds a two-turn length of prepared cold-rolled, oriented steel into the electrical windings of an Allis-Chalmers distribution transformer.*

Results in Low Exciting Current . . . Low Losses

Curvacore design fully utilizes the advantages of cold-rolled, oriented steel. First, steel is wound from a continuous strip of steel, shaped and annealed. The annealing process relieves mechanical stresses and sets the shape of the core. Then core steel is unwound, cut into two-turn lengths and nested in proper order for assembly around the coils.

Curvacore design permits the flux path to follow the grain of the steel. This results in high permeability, low hysteresis losses and a mechanically stronger core structure of less weight than previous design.

Better Regulation and Cooling

In addition, coils are arranged in low-high-low sequence which gives lower impedance resulting in better regulation characteristics. Liberal cooling ducts provide large contact areas between windings and oil to keep copper-to-oil gradient low.

As a result of careful design and manufacture, you get a compact, efficient transformer. And you get extra features like improved impulse strength, sealed tank construction, and excellent surface protection. For complete details, call your nearby A-C district office or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4099

Curvacore is an Allis-Chalmers trademark.

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